Nakamichi

Service Manual

Nakamichi 681ZX

Discrete Head Cassette Deck

681ZX

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1. GENERAL

1.1. Control Functions

The Nakamichi 681ZX control functions are shown below:

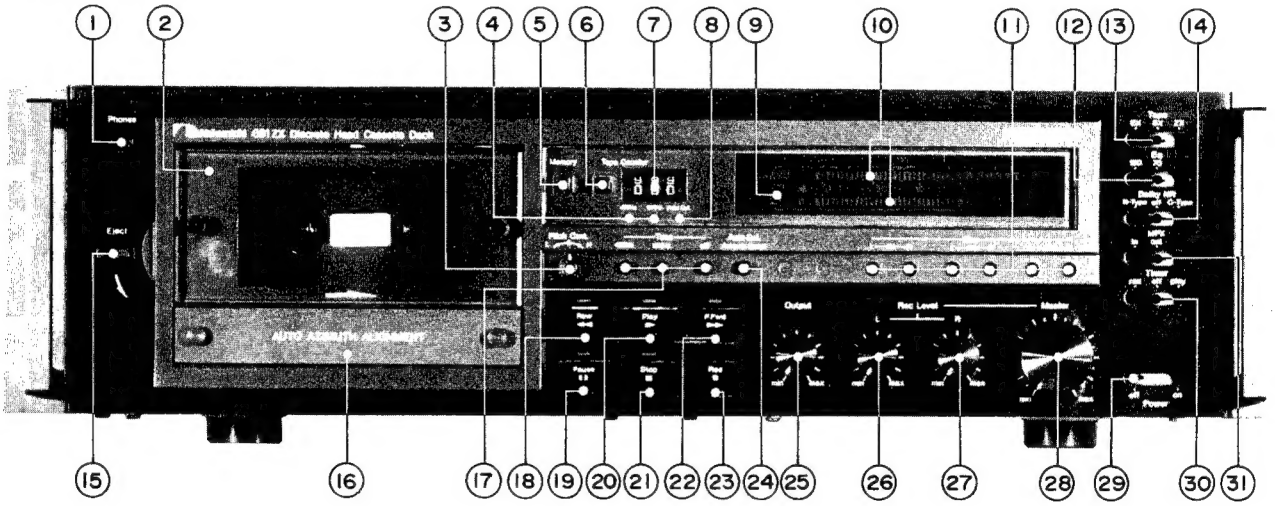


Fig. 1.1 Front View

1. Headphone Jack
2. Cassette Holder
3. Pitch Control
4. Test Tone Indicator
5. Tape Start Memory Switch
6. Counter Reset Button
7. Tape Counter
8. Auto Calibration Indicator
9. RAMM Display
10. Fluorescent (FL) Level Indicators
11. Bias Adjustment Controls
12. Eq. Switch
13. Tape Switch
14. Dolby NR Switch
15. Eject Lever
16. Alignment Screw Cover
17. Test Tone Switch
18. Rewind Button
19. Pause Button
20. Play Button
21. Stop Button
22. Fast-Forward Button
23. Record Button
24. Auto Calibration Button
25. Output Level Control
26. Input Level Control (L ch)
27. Input Level Control (R ch)
28. Master Input Level Control
29. Power Switch
30. Timer Switch
31. MPX Filter Switch

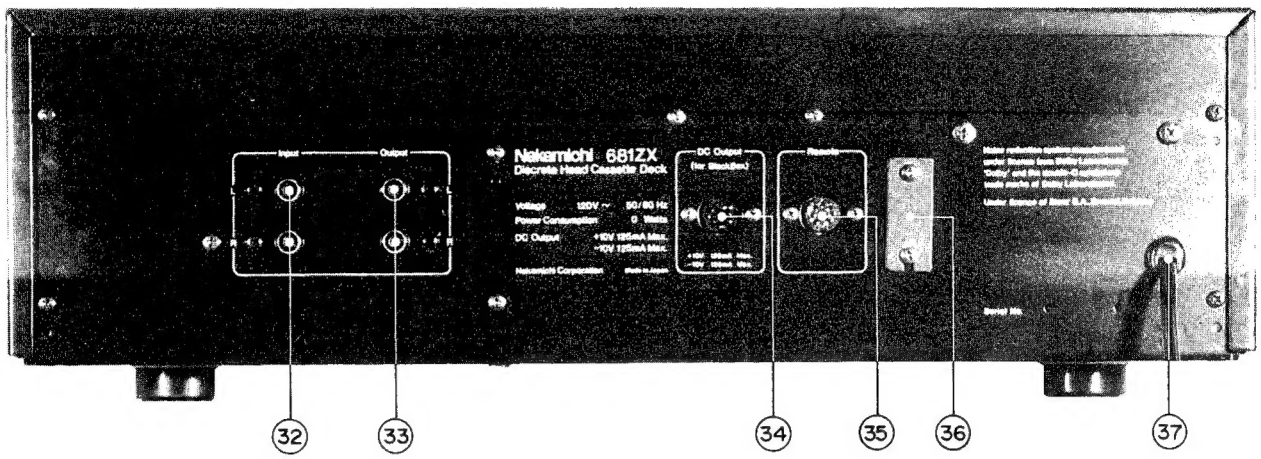


Fig. 1.2 Rear View

32. Input Jacks
33. Output Jacks
34. DC Output Jack
35. Remote Control Jack
36. Voltage Selector
37. Power Cord

1.2. Voltage Selector

Voltage selector is installed on the rear panel for Other Version of the Nakamichi 681ZX.
This voltage selector can select either 120 V or 220-240 V at customer's disposal.

2. REMOVAL PROCEDURES

2.1. Side Panel Ass'y

Refer to Fig. 2.1.

(1) Remove F01 and F02, then disassemble F03 (Side Panel Ass'y).

2.2. Top Cover Ass'y

Refer to Fig. 2.1.

(1) Remove Side Panel Ass'y referring to item 2.1.
(2) Remove F04 and F05, then disassemble F06 (Top Cover Ass'y).

2.3. Bottom Cover Ass'y

Refer to Fig. 2.1.

(1) Remove F07, then disassemble F08 (Bottom Cover Ass'y).

2.4. Cassette Case Cover Ass'y and Azimuth Alignment Cover Ass'y

Refer to Fig. 2.1.

(1) Turn fully counterclockwise 2 screws which are mounted on the Cassette Case Cover, then disassemble F09 (Cassette Case Cover Ass'y).
(2) Turn fully counterclockwise 2 screws which are mounted on the Front Panel Escutcheon Ass'y, then disassemble F10 (Azimuth Alignment Cover Ass'y).

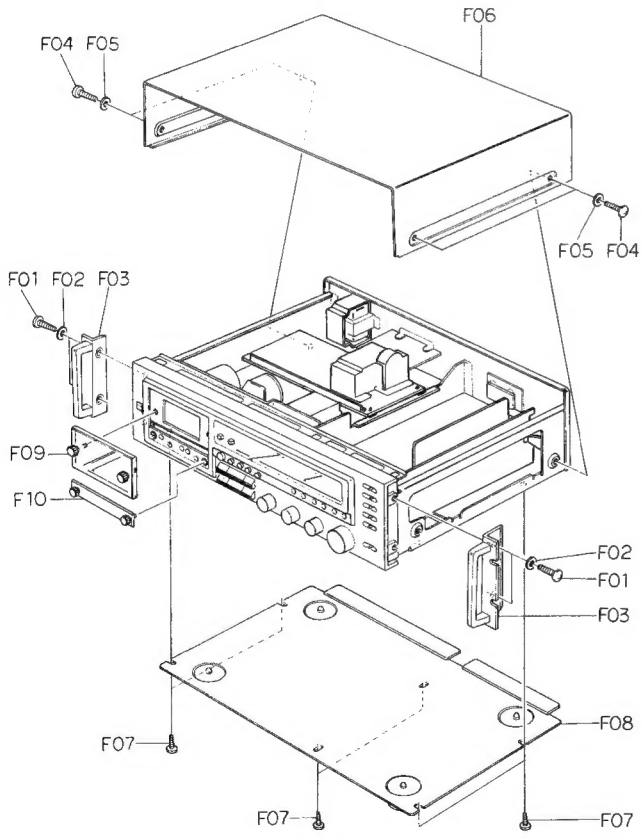


Fig. 2.1

2.5. Front Panel Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.
(2) Remove F01, then turn F02 (Auto Level P.C.B. Ass'y) over as an arrow head.
(3) Pull out F03 (Volume Knob A), F04 (Volume Knob B) and F05 (Pitch Control Knob).
(4) Remove F06, F07 and F08, then disassemble F09 (Front Panel Ass'y including 3 connectors).

2.6. Headphone Jack Ass'y

Refer to Fig. 2.2.

(1) Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F10, then disassemble F11 (Headphone Jack Ass'y).

2.7. Mechanism Ass'y

Refer to Fig. 2.2.

(1) Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F12, then disassemble F13 (Mechanism Ass'y including 6 connectors).

2.8. FL Indicator Ass'y and FL Indicator P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F01, then disassemble F02 (FL Indicator Ass'y including 1 connector).
(3) Remove F03 (FL Indicator Hold Plate) and F04 (Indicator P.C.B. Plate), then disassemble F05 (FL Indicator Holder L), F06 (FL Indicator Holder R) and F07 (FL Indicator P.C.B. Ass'y).

2.9. Auto Level P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Remove 1 connector and the wires connected by wrapping from F09 (Auto Level P.C.B. Ass'y).
(3) Remove F08, then disassemble F09 (Auto Level P.C.B. Ass'y) by releasing the self-interlocking pin of the P.C.B. supporters.

2.10. Auto Level Motor Ass'y

Refer to Fig. 2.3.

(1) Remove Auto Level P.C.B. Ass'y referring to item 2.9.
(2) Remove F10, then disassemble F11 (Auto Level Motor Ass'y).
(3) Remove F12, then disassemble F13 (Auto Level Motor).
(4) Remove F14, then disassemble F15 (Assembly of Volume Holder and Volume 10 kΩ) and F16 (Assembly of Motor Belt, Drive Pulley, Drive Pulley Shaft and Volume Drive Jointer).

(5) Remove F17, then disassemble F18 (Volume 10 kΩ including 2 connectors).

2.11. Logic P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Remove Auto Level P.C.B. Ass'y referring to item 2.9.
(2) Remove 5 connectors and the wires connected by wrapping from F20 (Logic P.C.B. Ass'y).
(3) Remove F19, then disassemble F20 (Logic P.C.B. Ass'y).

2.12. Dolby NR P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y referring to item 2.2.
(2) Remove 2 connectors and wires connected by wrapping from F22 (Dolby NR P.C.B. Ass'y).
(3) Remove F21, then disassemble F22 (Dolby NR P.C.B. Ass'y).

2.13. Switch P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Pull out F23 (Function Switch Knob Ass'y).
(3) Remove the wires connected by wrapping from F26 (Switch P.C.B. Ass'y).
(4) Remove F24 and F25, then disassemble F26 (Switch P.C.B. Ass'y).

2.14. Main P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Remove Dolby NR P.C.B. Ass'y and Switch P.C.B. Ass'y referring to items 2.12 and 2.13.
(2) Remove flat cables, 3 connectors and wires connected by wrapping from F28 (Main P.C.B. Ass'y).
(3) Remove F27, then disassemble F28 (Main P.C.B. Ass'y).

2.15. Volume P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Remove FL Indicator Ass'y referring to item 2.8.
(2) Remove F29 and a flat cable, then disassemble F30 (Volume P.C.B. Ass'y).

2.16. Bias Cal. P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F31, then disassemble F32 (Bias Cal. Ass'y).
(3) Remove F33, then disassemble F34 (Bias Cal. P.C.B. Ass'y).

2.17. Power Switch

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F35, then disassemble F36 (Power Switch Knob).
(3) Remove F37, then disassemble F38 (Power Switch Holder Ass'y).
(4) Remove F39, then disassemble F40 (Power Switch).

2.18. Lamp P.C.B. B Ass'y and Lamp P.C.B. C Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F41, then disassemble F42 (Insulator) and F43 (Lamp P.C.B. B Ass'y).
(3) Remove F44 (Lamp P.C.B. C Ass'y) by releasing the self-interlocking pin of the Reflector.

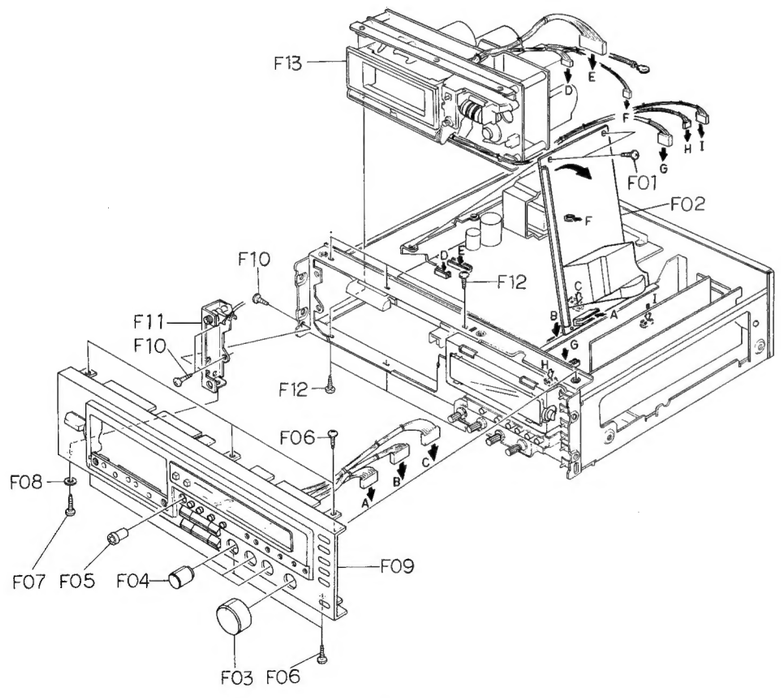


Fig. 2.2

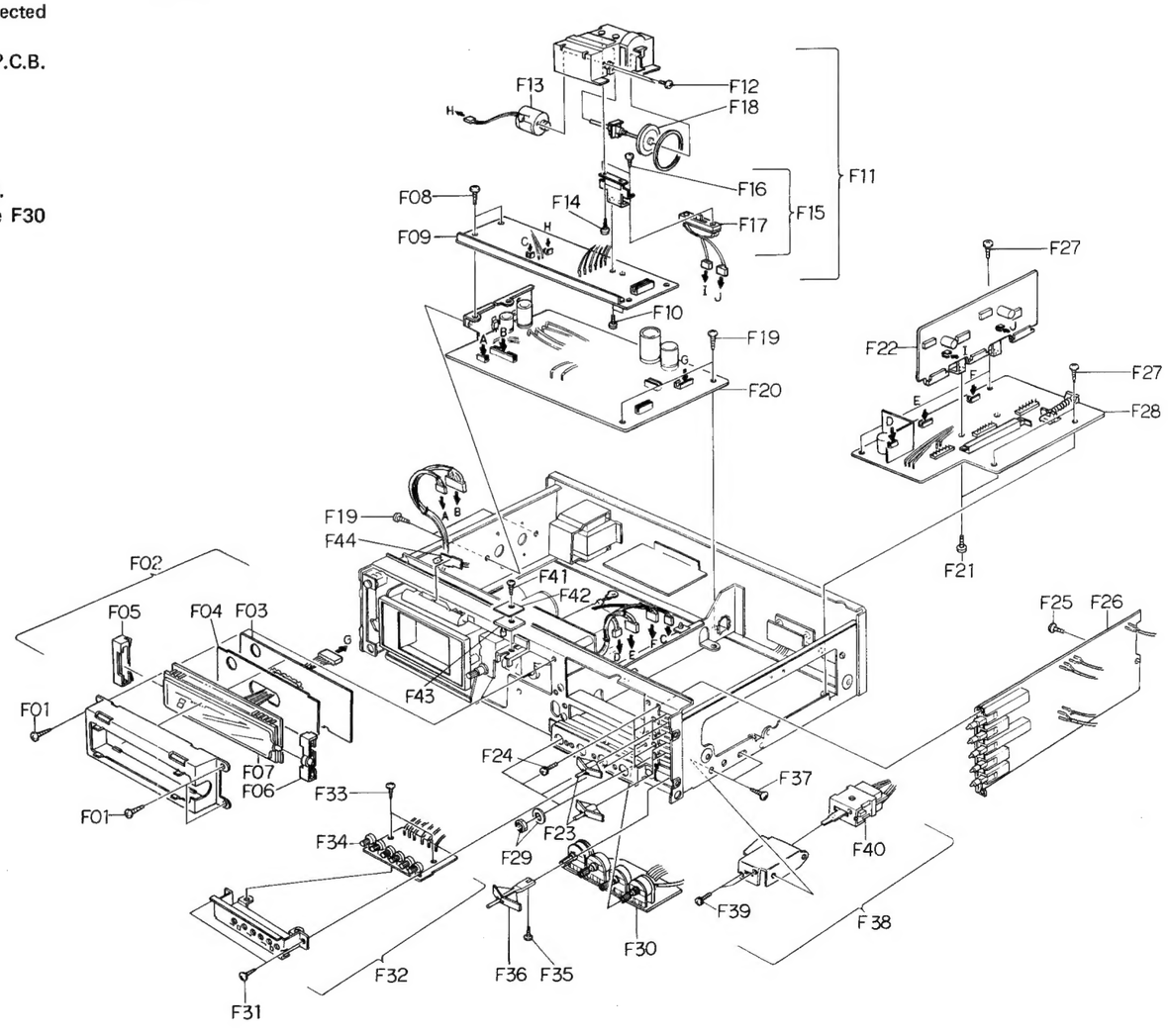


Fig. 2.3

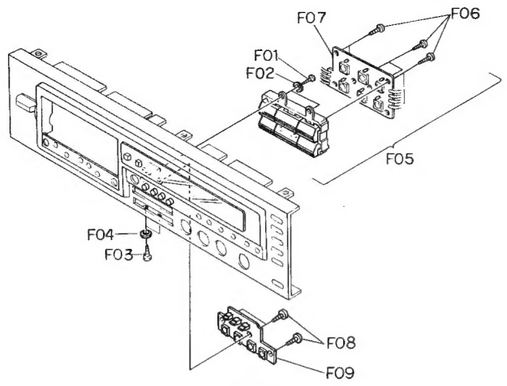


Fig. 2.4

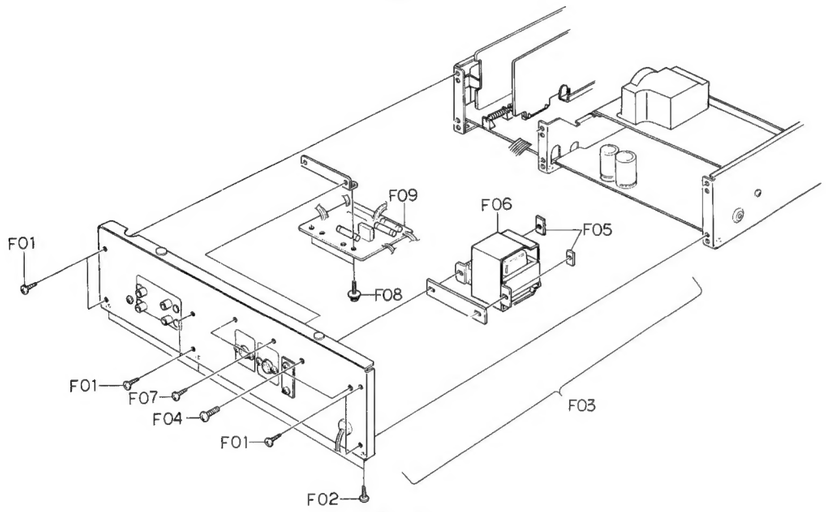


Fig. 2.5

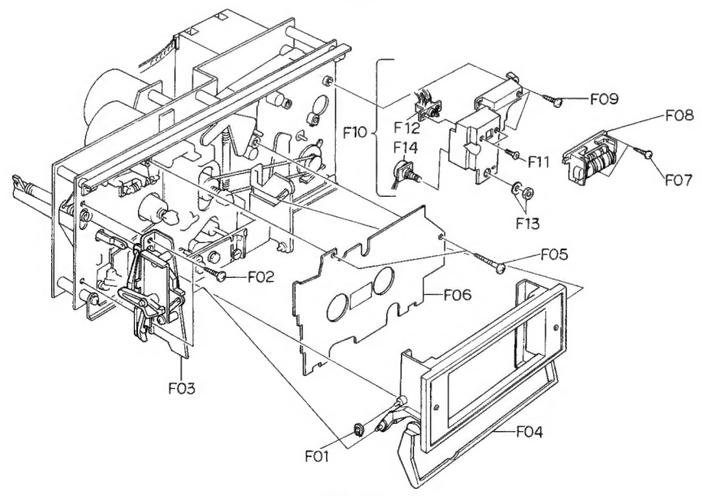


Fig. 2.6

2.19. Control Switch P.C.B. Ass'y and Calibration Indicator P.C.B. Ass'y

Refer to Fig. 2.4.

(1) Refer to Fig. 2.2. Remove Front Panel Ass'y referring to item 2.5.
(2) Remove F01, F02, F03 and F04, then disassemble F05 (Control Button Ass'y).
(3) Remove F06, then disassemble F07 (Control Switch P.C.B. Ass'y).
(4) Remove F08, then disassemble F09 (Calibration Indicator P.C.B. Ass'y).

2.20. Rear Panel Ass'y

Refer to Fig. 2.5.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.
(2) Remove F01 and F02, then disassemble F03 (Rear Panel Ass'y).

2.21. Power Transformer and Fuse P.C.B. Ass'y

Refer to Fig. 2.5.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to items 2.2 and 2.3.
(2) Remove F04 and F05, then disassemble F06 (Power Transformer).
(3) Remove F07 and F08, then disassemble F09 (Fuse P.C.B. Ass'y).

2.22. Cassette Case Ass'y and Cover Plate Ass'y

Refer to Fig. 2.6.

(1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.7.
(2) Press the Eject Button to open the Cassette Case Ass'y.
(3) Remove F01 and F02, then disassemble F03 (Cassette Case Holder L Ass'y) by releasing the self-interlocking pin of the Damper Lock Arm and F04 (Cassette Case Ass'y).
(4) Remove F05, then disassemble F06 (Cover Plate Ass'y).

2.23. Tape Counter Ass'y, Memory Switch and Pitch Control Volume

Refer to Fig. 2.6.

(1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.7.
(2) Remove F07, then disassemble F08 (Tape Counter Ass'y).
(3) Remove F09, then disassemble F10 (Pitch Control Holder Ass'y).
(4) Remove F11, then disassemble F12 (Memory Switch).
(5) Remove F13, then disassemble F14 (Pitch Control Volume).

2.24. Capstan Motor Ass'y and Flywheel Ass'y

Refer to Fig. 2.7.

(1) Refer to Fig. 2.2. Remove Mechanism Ass'y referring to item 2.7.
(2) Remove F01 and F02, then disassemble F03 (Flywheel Holder Ass'y) and F08 (Capstan Belt).
(3) Remove F04, then disassemble F05 (Capstan Motor Ass'y).
(4) Remove F06, then disassemble F07 (Speed Cal. P.C.B. Ass'y).
(5) Remove F09 (Supply Flywheel Ass'y), then disassemble F10 (Take-up Flywheel Ass'y).
(6) After removing both Flywheel Assemblies, disassemble F11 (Thrust Washer 3mm), F12 (Thrust Washer 2.6mm), F13 (Flange Thrust Cap) and F14 (Flange Thrust Spring).

2.25. Sub Mechanism Chassis Ass'y

Refer to Fig. 2.7.

(1) Remove Flywheel Holder Ass'y referring to item 2.24.
(2) Remove F01 and F02, then disassemble F03 (Sub Mechanism Chassis Ass'y).

2.26. Control Motor Ass'y and Reel Motor Ass'y

Refer to Fig. 2.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.25.
(2) Remove F04, then disassemble F05 (Control Motor Ass'y).
(3) Remove F06, then disassemble F07 (Reel Motor Ass'y).

2.27. Cam Control Volume

Refer to Fig. 2.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.25.
(2) Remove F08, then disassemble F09 (Volume Coupler).
(3) Remove F10, then disassemble F11 (Cam Control Volume).

2.28. Azimuth Motor Ass'y

Refer to Fig. 2.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.25.
(2) Remove F12, then disassemble F13 (Azimuth Alignment Motor Ass'y).
(3) Remove F14, then disassemble F15 (Azimuth Motor Ass'y) and F16 (Drive Pulley Ass'y).

2.29. Reel Hub Ass'y and Idler Ass'y

Refer to Fig. 2.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.25.
(2) Remove F17 (Reel Hub Head), then disassemble F18 (Reel Hub B Ass'y), F19 (Reel Hub Take-up Ass'y), F20 (Reel Hub Supply Ass'y), F21 (Back Tension Ass'y) and F22 (Back Tension Spring).
(3) Remove F23, then disassemble F24 (Idler Ass'y).

2.30. Cam Drive Gear and Control Cam

Refer to Fig. 2.8.

(1) Remove Sub Mechanism Chassis Ass'y referring to item 2.25.
(2) Remove F25, then disassemble F26 (Cam Drive Gear).
(3) Remove F27, then disassemble F28 (Counter-Load Arm Ass'y).
(4) Remove F29, then disassemble F30 (Control Cam).

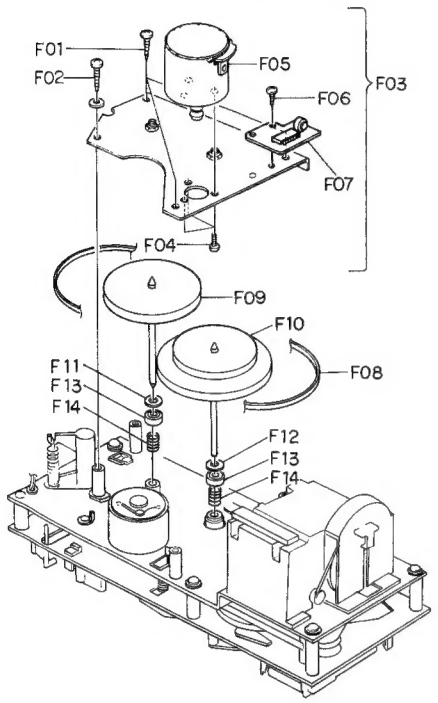


Fig. 2.7

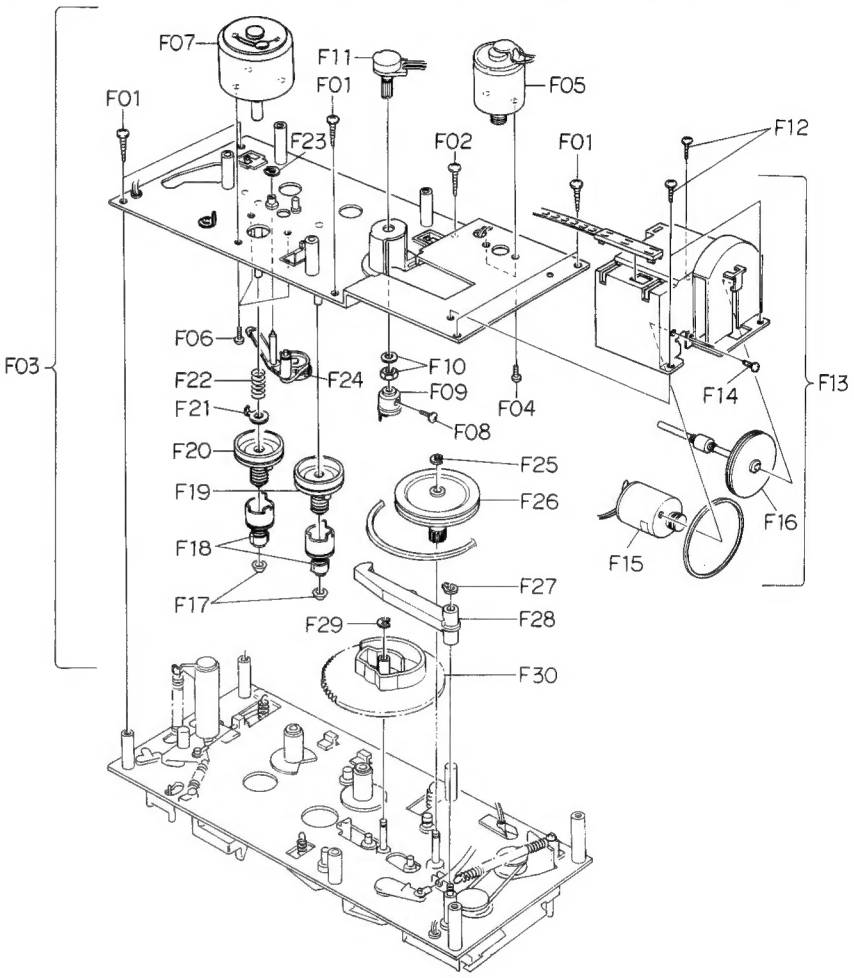


Fig. 2.8

2.31. Head Mount Base Ass'y

Refer to Fig. 2.9.

(1) Refer to Fig. 2.6. Remove Cassette Case Ass'y referring to item 2.22.
(2) Remove F01, then disassemble F02 (Head Mount Base Ass'y).

2.32. Pressure Roller Ass'y and Erase Head

Refer to Fig. 2.9.

(1) Remove Head Mount Base Ass'y referring to item 2.31.
(2) Remove F03, then disassemble F04 (Supply Pressure Roller Ass'y).
(3) Remove F05, then disassemble F06 (Erase Head).
(4) Remove F07, then disassemble F08 (Take-up Pressure Roller Ass'y).

2.33. Playback Head Ass'y and Record Head Ass'y

Refer to Fig. 2.9.

(1) Remove Head Mount Base Ass'y referring to item 2.31.
(2) Turn F09 by 90° by pushing it, then disassemble F10 (Playback Head Ass'y).
(3) Turn F10 by 90° by pushing it, then disassemble F12 (Record Head Ass'y) and F13 (RH Azimuth Alignment Plate).

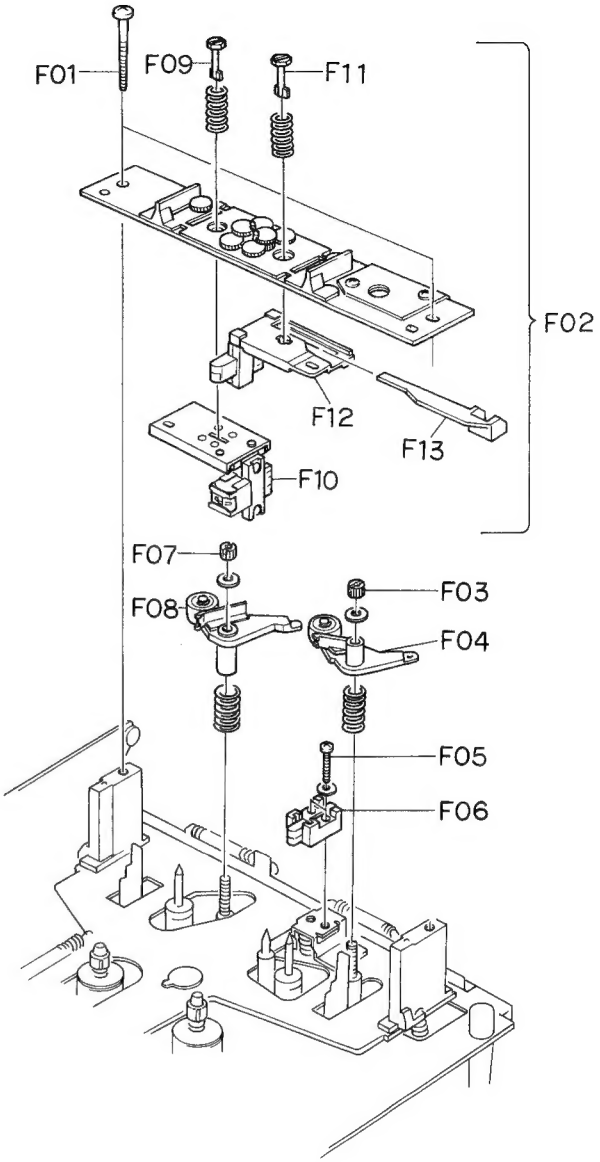


Fig. 2.9

3. MEASUREMENT INSTRUMENTS

(1) Audio Generator (20 Hz – 200 kHz)
(2) AC Millivolt Meter (with dB measures)
(3) Oscilloscope (DC – 5 MHz)
(4) Distortion Meter
(5) Speed & Wow/Flutter Meter
(6) Frequency Counter (DC – 1 MHz)
(7) Ohm Meter
(8) DC Volt Meter
(9) AC Volt Meter
(10) Torque Gauge (DA09013A)
(11) 15 kHz Azimuth Tape (DA09004A)
(12) 3 kHz Speed & Wow/Flutter Tape (DA09006A)
(13) 1 kHz Track Alignment Tape (DA09007A)
(14) 400 Hz Level Tape (DA09005A)
(15) 20 kHz PB Frequency Response Tape (DA09001A)
(16) 15 kHz PB Frequency Response Tape (DA09002A)
(17) 10 kHz PB Frequency Response Tape (DA09003A)
(18) Reference EXII Tape (DA09066A)
(19) Reference SX Tape (DA09025A)
(20) Reference ZX Tape (DA09037A)
(21) Tilt Check Gauge M-9039 (DA09039A)
(22) EH Tilt Check Gauge M-9040 (DA09040A)
(23) EH Stroke Check Gauge M-9051 (DA09051A)
(24) Stroke Check Gauge M-9047 (DA09047B)
(25) Record Head Mounting Gauge M-9048 (DA09048A)
(26) Back Tension Gauge (DA09055A)
(27) Tension Arm Adjustment Cassette (DA09056A)
(28) Audio Analyzer T-100
(including Distortion, Wow/Flutter, Speed, Oscillator and dB meters)

Note: (10) – (28) are the products of Nakamichi Corporation.

4. MECHANICAL ADJUSTMENTS

4.1. Mechanism Control Cam Adjustment

Before adjustment, disassemble the Front Panel Ass'y, then remove the Cover Plate referring to items 2.5 and 2.22.

(1) Offset Adjustment of Control Motor Driver

(a) Refer to Figs. 4.1 and 4.2.
Adjust VR402 and VR403 on the Logic P.C.B. Ass'y to locate approximately at the middle of the variable range. Then turn ON the Power switch.
VR402 (for Cam position stop)
VR403 (for Cam position play)

(b) Press the Stop button to set the N-681ZX in Stop mode.
Adjust VR402 (for stop) so that the "S" mark on the Cam corresponds to the pointer on the mechanism chassis.

(c) Press the Play button to set the N-681ZX in Playback mode.
(Cam will rotate, and the position marked with "PY" comes to the pointer.) Adjust VR403 (for play) so that the "PY" mark on the Cam corresponds to the pointer.

(d) Repeat above (b) and (c) 2 – 3 times so that the "S" and "PY" marks on the Cam correspond to the pointer accurately in Stop and Playback modes respectively.
(This adjustment is required because the position adjusted by one volume will be slightly changed when the other volume is adjusted.)

(e) Set the N-681ZX in F.F., Pause, Record, or Cue mode by pressing each button (press F.F. and Pause buttons to set the N-681ZX in Cue mode) and check to insure that the pointer is in a range of "F", "PS", "R", or "CU" mark respectively.

(f) If out of the range, precise adjustment for each position according to "(2) Offset Fine Adjustment of Control Motor Driver" will be required.

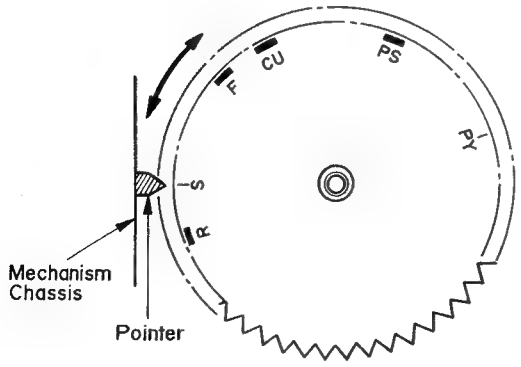


Fig. 4.1

(2) Offset Fine Adjustment of Control Motor Driver

Adjust only if a satisfactory result is not obtained in "(1) Offset Adjustment of Control Motor Driver". This adjustment is made by changing the value of the fixed resistors on the Logic P.C.B. Ass'y.

Note: The value of voltage is typical value.

(a) Observation Point of Reference Voltage

Observe the each voltage at the sliding contact of the Cam Control Volume VR405 (10 kΩ) in Stop, Fast (F.F. or Rew.), Pause, Record and Playback modes.

Note: When Record and Play buttons are pressed to set N-681ZX in Record mode, the Cam is first set to the record position in a short period of time then stays at the play position. Therefore, to keep the Cam at the record position, following procedure is required:
Short the both leads of capacitor C450 (4.7 μF 25V) on the Logic P.C.B. Ass'y with a jumper wire, then press the Record and Play buttons.

(b) Reference Voltage

Reference voltage at the sliding contact of VR405 (Cam Control Volume) in each mode is as follows:

Mode	Reference Voltage (Typical Value)
Record	4.1 V
Stop	3.0 V — 1.1 V +0.4 V −0.2 V
Fast (F.F./Rew.)	1.3 V — 1.7 V ±0.25 V
Pause	−2.8 V
Play	−5.4 V — 2.6 V ±0.4 V

(c) Resistors for Adjustment

Mode	Ref. No.	Typical Value
Stop	R461	9.1 kΩ (F)
Fast (F.F./Rew.)	R462	4.32 kΩ (F)
Pause	R445	287 kΩ (F)
Play	R443	174 kΩ (F)
Record	R601	27 kΩ

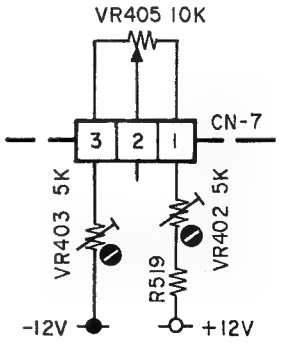


Fig. 4.2

(d) Adjustment Procedures

1) Press the Stop button to set the N-681ZX in Stop mode.
   Adjust the value of R461 to obtain 3.0 V (±0.6 V) at the sliding contact of VR405.
   Note: When R461 is adjusted, the reference voltage in Fast (F.F. or Rew.) mode is changed. Therefore, re-check of the reference voltage in Fast (F.F. or Rew.) mode is required. If the reference voltage is out of the range, re-adjustment of R462 according to next step 2) is necessary.
2) Set the N-681ZX in F.F. mode, then adjust the value of R462 so that the voltage at the sliding contact of VR405 will become lower by 1.7 V (±0.25 V) than in Stop mode.
3) Press the Pause button to set the N-681ZX in Pause mode.
   Adjust the value of R445 to obtain −2.8 V (+0.4, −0.15 V) at the sliding contact of VR405.
4) Set the N-681ZX in Playback mode, then adjust the value of R443 so that the voltage at the sliding contact of VR405 will become lower by 2.6 V (±0.4 V) than in Pause mode.
5) Short the both leads of capacitor C450 with a jumper wire.
   Set the N-681ZX in Record mode, then adjust the value of R601 so that the voltage at the sliding contact of VR405 will become higher by 1.1 V (+0.4, −0.2 V) than in Stop mode.
   Note: Remove the short of C450 after completion of adjustment.

(3) Cam Timing Adjustment

(a) Remove the wires from the Control Motor terminals to set the motor open.
(b) Without loading a cassette tape and with pressing the record protecting switch with your finger tip, press the Record and Play buttons to set the N-681ZX in Record mode.
(c) Turn the Cam and bring the "PY" mark toward the pointer by hand. Reel Motor will rotate before the "PY" mark reaches the pointer. Adjust the value of R483 and R484 so that the voltage at the sliding contact of VR405 becomes −3.6 V (±0.3 V) when Reel Motor starts rotation.
(d) Observe the mute signal at the Q418 collector.
   Turn the Cam referring to above step (c) and check to insure that the voltage at the sliding contact of VR405 is −3.8 V (±0.3 V) when mute is released (mute signal changes from H to L).
   (This voltage is determined by the adjustment of R483 and R484 in above step (c).)
(e) Observe the $\overline{\text{Rec.}}$ signal at the Q417 collector. Turn the Cam referring to above step (c) and adjust the value of R488 to obtain −2.1 V (±0.4 V) at the sliding contact of VR405 when $\overline{\text{Rec.}}$ signal changes from H to L (bias oscillation will begin).
(f) Upon completion of the above adjustment, re-connect wires to the motor terminals.

4.2. Tape Speed Adjustment

(1) Remove the Top Cover Ass'y referring to item 2.2.
(2) Connect a Frequency Counter to the Output Jack.
(3) Load a 3 kHz Speed Wow/Flutter Tape (DA09006A) and play it back.
(4) Referring to Fig. 4.3, adjust the Tape Speed Adjustment Volume VR501 on the Speed Cal. P.C.B. Ass'y to obtain 3,000 Hz on the Frequency Counter.
   CCW: Motor drives slowly.
   CW: Motor drives fast.

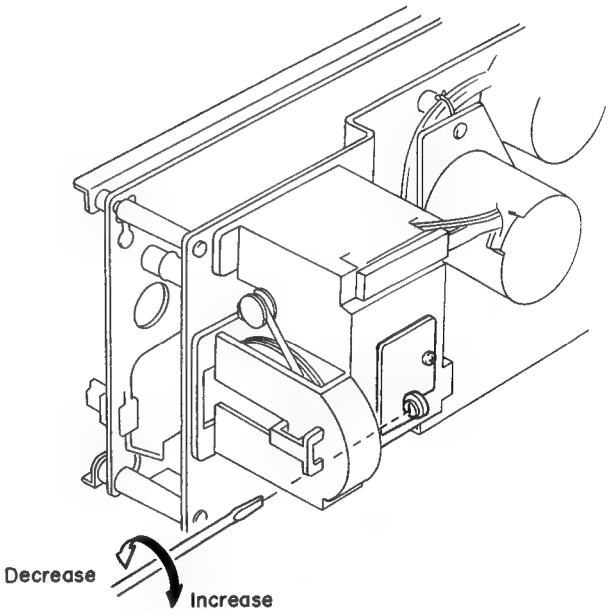


Fig. 4.3

4.3. Record Head and Playback Head Tilt Adjustment

Note: On items 4.3 – 4.9, refer to Fig. 4.4 flow chart.
Refer to Figs. 4.5 and 4.6.

(1) Load a Tilt Check Gauge M-9039 (DA09039A) in the N-681ZX.
(2) Clip the grounding terminal of the Tilt Check Gauge with one end of the cord with clip, and the chassis of the N-681ZX with the other end.
(3) Remove both of the Height Gears.
(4) Set the N-681ZX in Play mode. Check to insure whether the Beacons Playback Head "Upper" or "Lower" and Record Head "Upper" or "Lower" are illuminating. In order not to give damages onto the head surfaces, push both of slide knobs of the Gauge to the direction of arrow marks, then return them to the original place to be in contact with record head and playback head surfaces after Play mode is securely locked.
(5) Check to insure freedom from contact between the Gauge and pad lifter.
(6) Beacon Playback Head "Lower" will light on when height adjustment screw (P) turned clockwise but Playback Head "Upper" when counterclockwise. Adjust so that both "Upper" and "Lower" will light on even when you move the slide knob to the direction of an arrow mark and then return them to the original place.
(7) Same procedures will apply to the Beacons Record Head "Upper" and "Lower", except for the height adjustment screw (R).
(8) Set the N-681ZX in Stop mode and fit both of the serrated Height Gears. Then set the N-681ZX again in Play mode and insure all of the 4 Beacons are illuminating. If not, (3) through (7) will have to be repeated till satisfactory results are obtained.

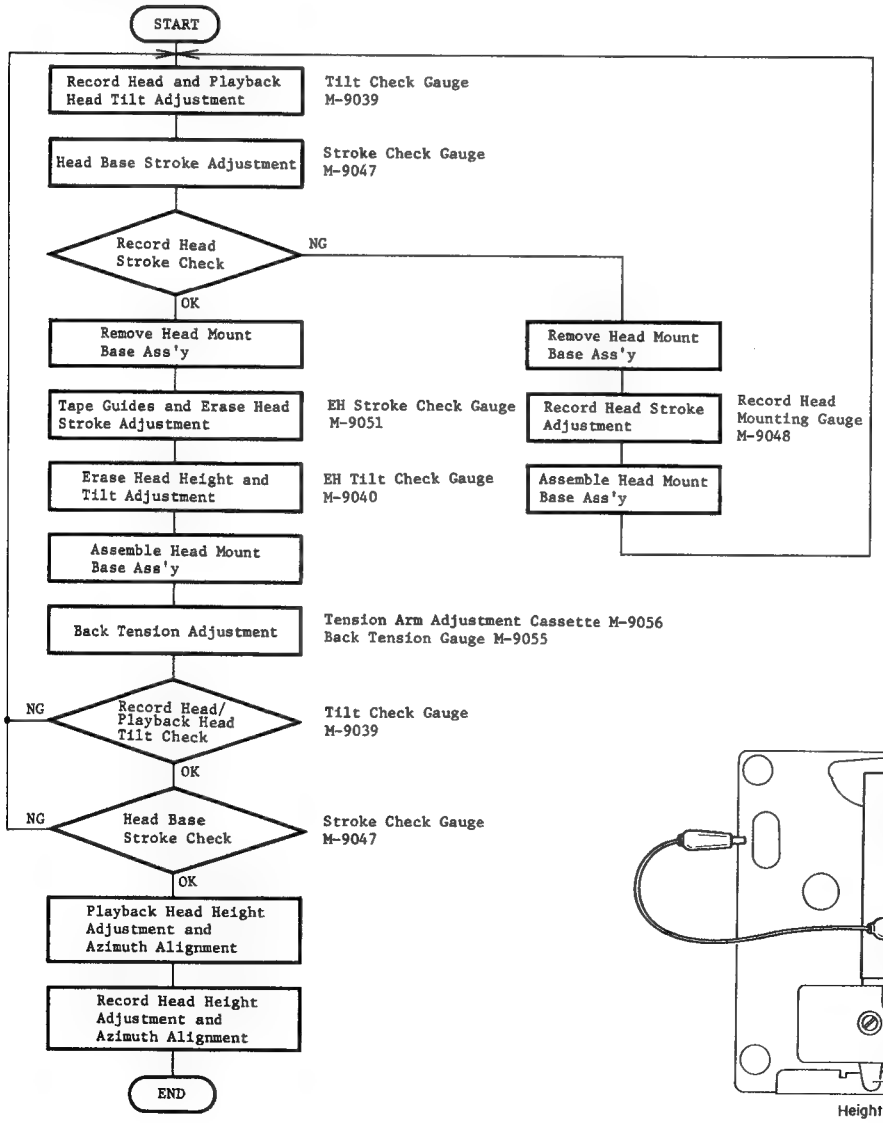


Fig. 4.4

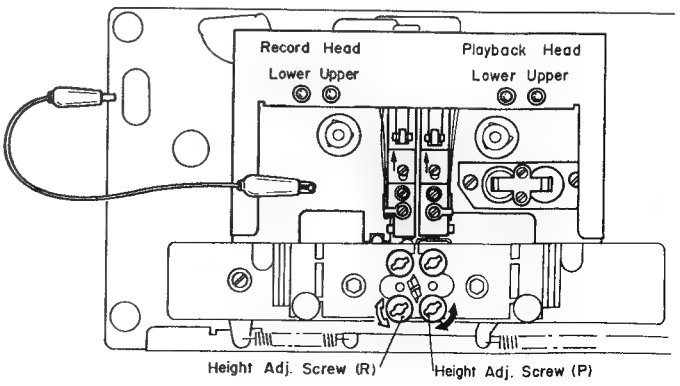


Fig. 4.5

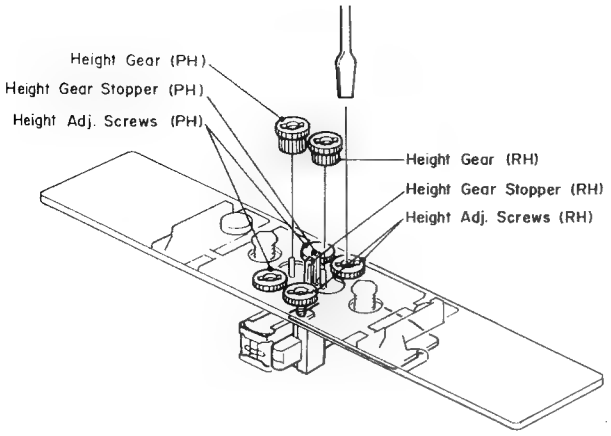


Fig. 4.6

4.4. Head Base Stroke Adjustment

Note: Before you conduct this adjustment, adjust with a "Tilt Check Gauge" to insure freedom from tilt on the playback head and record head.

(1) Head Base Stroke Adjustment in Play Mode

Refer to Fig. 4.7.

(a) Load a Stroke Check Gauge M-9047 (DA09047B) in the N-681ZX.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-681ZX in Play mode. Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjustment can be made by moving the stroke adjuster assembled in the head base assembly (either forwardly or backwardly).

(e) Check to insure whether the "P" pointer on the Playback Head Indicator locates between the 2 lines on the Record Head Indicator, thus check can be made on record head stroke.

(f) If the record head stroke is noted to be misaligned, adjustment can be made with a Record Head Mounting Gauge M-9048 (DA09048A).

(2) Head Base Stroke Adjustment in Cue Mode

Refer to Figs. 4.7 and 4.8.

(a) Load a Stroke Check Gauge M-9047 (DA09047B) in the N-681ZX.

(b) Move Record Head Indicator and Playback Head Indicator to the direction of arrow mark "A" with your finger tip and then set the N-681ZX in Cue (F.F. and Pause) mode.
Then slowly release the Indicators and insure whether each of the Indicators is in contact with record and playback heads.

(c) Check to insure whether the "C" pointer on the Playback Head Indicator locates between the 2 lines on the Indicator Plate.

(d) If the playback head stroke is noted to be misaligned, adjust VR401 on the Logic P.C.B. Ass'y till satisfactory results are obtained.

(e) After completion of the Head Base Stroke Adjustment, check to insure accuracy of the Head Base Stroke Adjustment in Play mode.
If the above are inaccurate, items (1) and (2) will have to be repeated till satisfactory results are obtained.

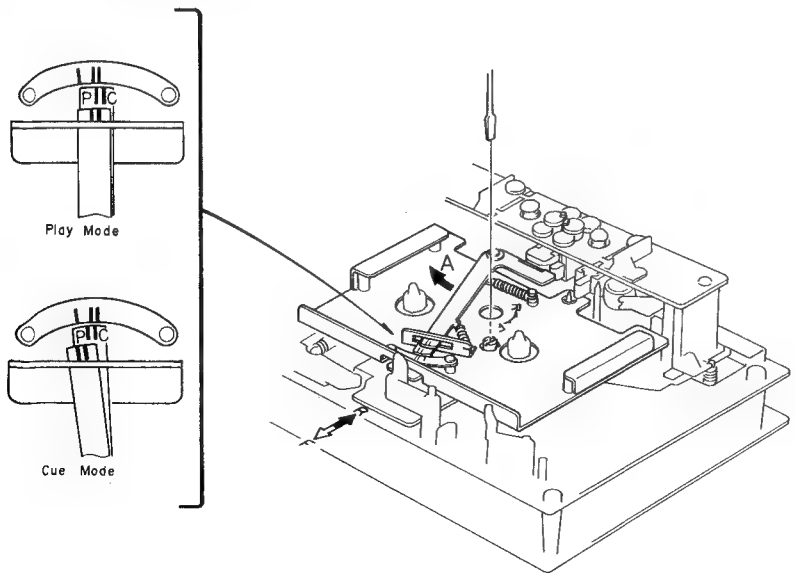


Fig. 4.7

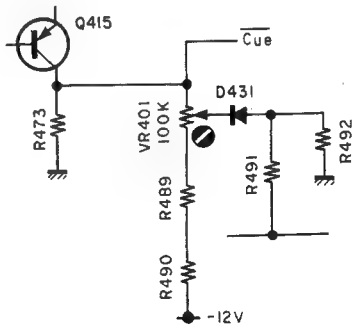


Fig. 4.8

4.5. Tape Guides Adjustment and Erase Head Stroke Adjustment

Remove Head Mount Base Ass'y referring to item 2.31. Refer to Figs. 4.9 and 4.10.

(1) Supply Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9051 (DA0-9051A) in the N-681ZX.
(b) Set the N-681ZX in Play mode.
(c) Slide the Supply Tape Guide Check Bar down against the supply tape guide, thus check can be made on supply tape guide height.
(d) If the supply tape guide is misaligned, the Supply Tape Guide Check Bar will not come into the supply tape guide. If such is noted, turn to adjust the height adjustment nut A till the Supply Tape Guide Check Bar is accepted by the supply tape guide.
(e) If the above are insured, set the N-681ZX in Pause mode, then in Play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

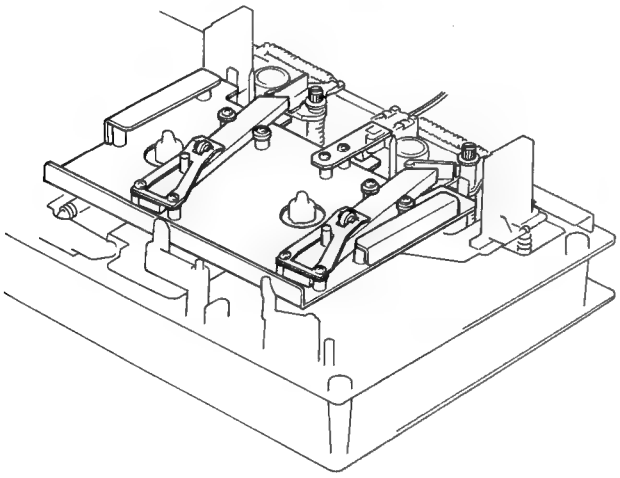


Fig. 4.9

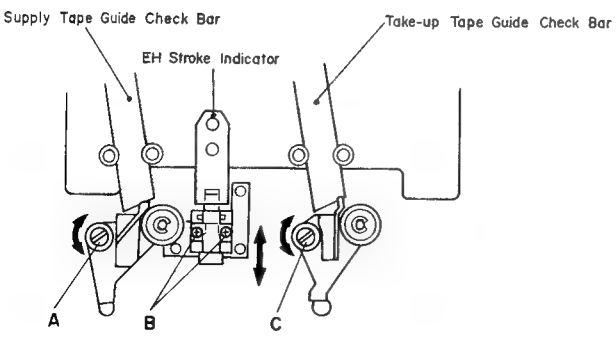


Fig. 4.10

(2) Take-up Tape Guide Height Adjustment

(a) Load an EH Stroke Check Gauge M-9051 (DA0-9051A) in the N-681ZX.
(b) Set the N-681ZX in Play mode.
(c) Slide the Take-up Tape Guide Check Bar down against the take-up tape guide, thus check can be made on take-up tape guide height.
(d) If the take-up tape guide is misaligned, the Take-up Tape Guide Check Bar will not come into the take-up tape guide. If such is noted, turn to adjust the height adjustment nut C till the Take-up Tape Guide Check Bar is accepted by the take-up tape guide.
(e) If the above are insured, set the N-681ZX in Pause mode, then in Play mode to see whether adjustments are appropriately made. If not, (b) through (e) will have to be repeated till satisfactory results are obtained.

(3) Erase Head Stroke Adjustment

(a) Load an EH Stroke Check Gauge M-9051 (DA0-9051A) in the N-681ZX.
(b) Set the N-681ZX in Play mode, thus check can be made on erase head stroke through the EH Stroke Indicator.
(c) Check to insure whether the erase head surface is aligned with red line on the EH Stroke Indicator. If not, adjust the erase head stroke by loosening 2 screws B that assemble erase head and erase head plate.
(d) After completion of adjustment, 2 pcs. of screws shall be locked with lock tight paint.

4.6. Erase Head Height and Tilt Adjustment

Refer to Figs. 4.11 and 4.12.

(1) Remove Head Mount Base Ass'y referring to item 2.31.
(2) Load an EH Tilt Check Gauge M-9040 (DA09040A) in the N-681ZX.
(3) Set the N-681ZX in Stop mode.
(4) Check to insure whether one of the 3 Beacons is illuminating. Look down the mirror as shown by an arrow mark and slowly turn the Screw "Height" counterclockwise (or clockwise) so that the two horizontal lines on the mirror will become superposed on the line (in different color) of the erase head, and check to insure whether Beacon "1" is illuminating.
(5) Turn Screw "Tilt" counterclockwise (or clockwise) to light on Beacon "2". Excessive turning will cause the Beacon "1" to light off. Adjustments of Screw "Tilt" will therefore be conducted till both of the Beacons "1" and "2" illuminate.
(6) Turn Screw "Azimuth" counterclockwise (or clockwise) to light on Beacon "3". Excessive turning will cause either Beacon "1" or "2" to light off, and therefore adjust Screw "Azimuth" until all of the 3 Beacons "1", "2" and "3" illuminate.

(7) Check to insure whether the horizontal line on the mirror corresponds to that on the erase head. If not, (4) through (7) will have to be repeated till satisfactory results are obtained.
(8) After completion of adjustment, 3 pcs. of screws shall be locked with lock tight paint.

Note: Before use of this gauge, check to insure freedom from dust or dirts, or overflow in the groove of the erase head surface.

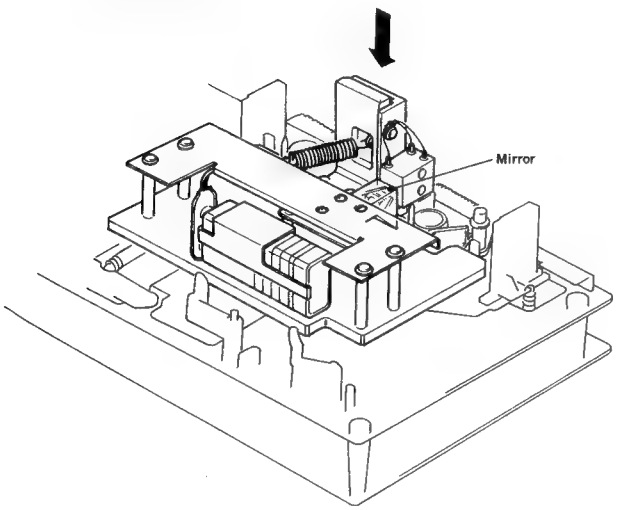


Fig. 4.11

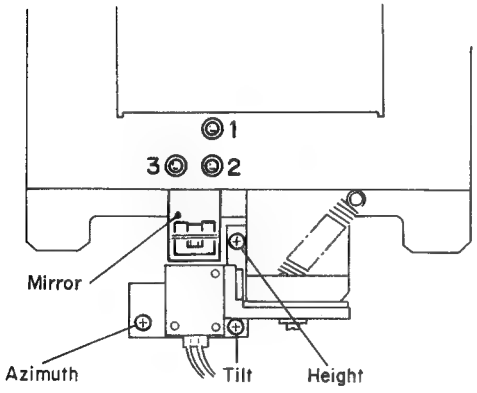


Fig. 4.12

4.7. Back Tension Adjustment

Refer to Figs. 4.13 – 4.16.

(1) Load a Tension Arm Adjustment Cassette (DA0-9056A) in the N-681ZX referring to Fig. 4.13.
(2) Set the N-681ZX in Play mode.
(3) Bend the Back Tension Arm with pliers so that the gap between the Cassette Holding Spring assembled on the Head Base Ass'y and the Back Tension Arm becomes 0.5 mm as shown in Fig. 4.14. Do not bend the top of the Back Tension Arm.
(4) Set the N-681ZX in Stop mode, and remove the Tension Arm Adjustment Cassette (DA09056A), then set the N-681ZX in Cue mode.
In Cue mode, check to insure that the gap is found between the Supply Reel Hub B Ass'y and the Felt of Back Tension Ass'y as shown in Fig. 4.15.
(5) Load the Back Tension Gauge (DA09055A) in the N-681ZX.
(6) Set the N-681ZX in Play mode and read the torque value of Back Tension Gauge.
If the value is in a range of 6 g-cm to 10 g-cm, adjustment is not necessary. If not, change the installation point of the Back Tension Spring as shown in Fig. 4.16, and obtain the torque of 7 g-cm to 9 g-cm range.

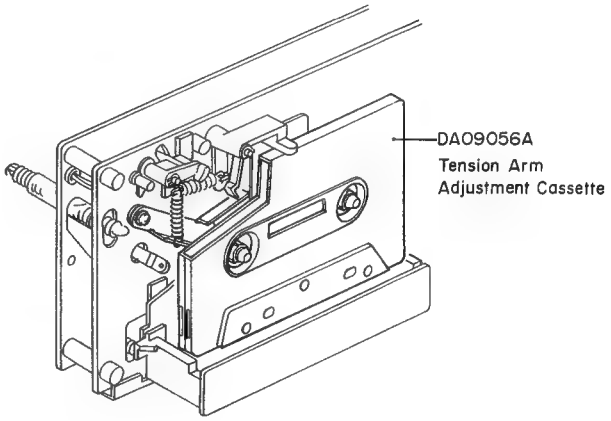


Fig. 4.13

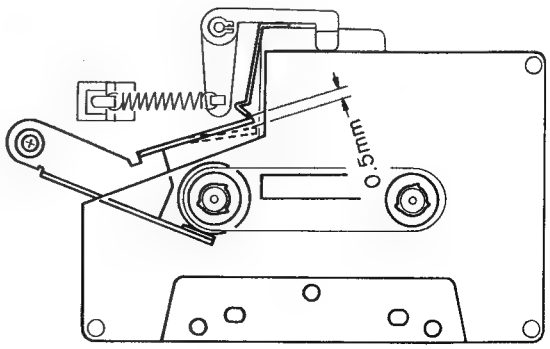


Fig. 4.14

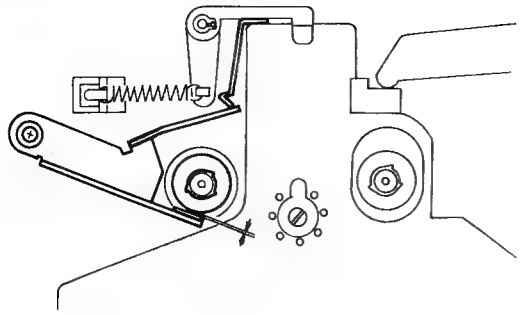


Fig. 4.15

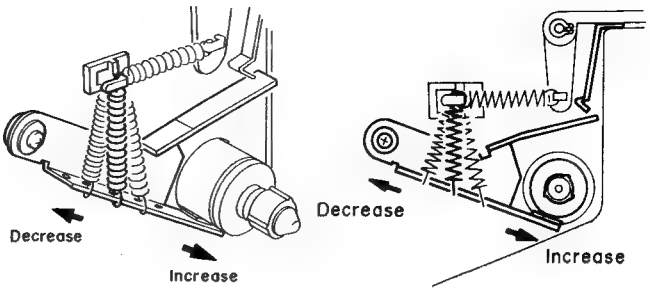


Fig. 4.16

4.8. Playback Head and Record Head Height Adjustment and Azimuth Alignment

(1) Playback Head Height Adjustment and Azimuth Alignment

Refer to Fig. 4.17.

(a) Connect a VTVM to the Output Jacks.

(b) Load a 1 kHz Track Alignment Tape (DA09007A), then set the N-681ZX in Play mode.

(c) Turn the PH Height Gear until the outputs of both channels become minimum.

(d) Load a 15 kHz Azimuth Tape (DA09004A), then set the N-681ZX in Play mode.

(e) Turn the PH Azimuth Alignment Screw until the outputs of both channels become maximum.

(f) Repeat above steps (b) through (e) one or two times to obtain optimum performance.

(2) Record Head Height Adjustment and Azimuth Alignment

Refer to Figs. 4.17 – 4.21.

(a) Set the N-681ZX in Stop mode.
Turn the Azimuth Motor in the Azimuth Alignment Motor Ass'y by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.18.
Remove the Azimuth Alignment Wire by pulling out from the Azimuth Alignment Motor Ass'y. In this case, do not move the Slide Lever of the Azimuth Alignment Wire.
Ground IC902-13 and IC903-1 on the Auto Level P.C.B. Ass'y with jumper wires.

(b) Connect a VTVM to the Playback Eq. Amp. outputs, terminals L7M and R7M on the Main P.C.B. Ass'y or terminals 1 (L ch) and 3 (R ch) on the Auto Level P.C.B. Ass'y.

(c) Load a Reference SX Tape (DA09025A). Set the Eq. switch to 70 μs and the Tape switch to SX. Then set the N-681ZX in Record and Play mode.

(d) Set the Test Tone switch to 400 Hz, then turn the RH Height Gear until the outputs of both channels become maximum.

(e) Set the Test Tone switch to 15 kHz, then set the N-681ZX in Record and Play mode. Turn the RH Azimuth Alignment Screw until the outputs of both channels become maximum.

(f) Repeat above steps (d) and (e) one or two times to obtain optimum performance.

(g) After completion of the above adjustments, perform the following electrical adjustment.
Note: Use the same side of the same tape as used in the above steps.
1) Perform the Auto Azimuth Alignment function as follows:
a) Press the Record and Pause buttons.
b) Pressing the Auto Calibration button, press the Play button.
The Auto Calibration Indicator starts flashing.
2) Adjust VR901 on the Auto Level P.C.B. Ass'y so that the Azimuth Motor stops its rotation.

(h) Set the N-681ZX in Stop mode.
Mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.19.
(Correct the position of the Slide Lever of the Azimuth Alignment Wire by sliding by hand to insert the Slide Lever into the receptacle of the Azimuth Alignment Motor Ass'y.)
Remove the jumper wires from IC902-13 and IC903-1 on the Auto Level P.C.B. Ass'y.

(i) After completion of the above adjustments, record 400 Hz tone to the same portion of both sides A and B of the tape.

(j) Immerse the recorded tape in a magnetized developing solution. In turn, check to insure that the recording head tracks across the center are separated with a distance of 0.55 to 0.75 mm (typically 0.65 mm) as illustrated in Fig. 4.21.
Note: Liquid for tape magnetized development solution
"MAGNA-SEE SOUND CRAFT a product of CBS RECORDS a division of Columbia Broadcasting System, Inc., Danbury, Conn. 06810 U.S.A., or equivalent".
After development, clean the tape otherwise pressure rollers and heads will become dirty.

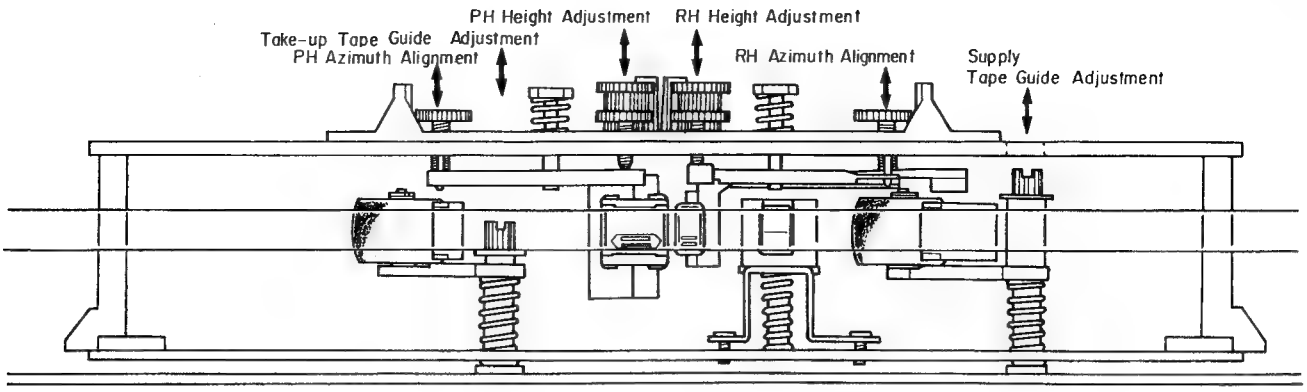


Fig. 4.17

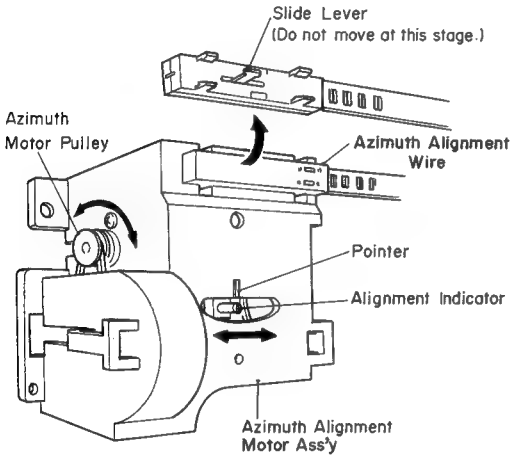


Fig. 4.18

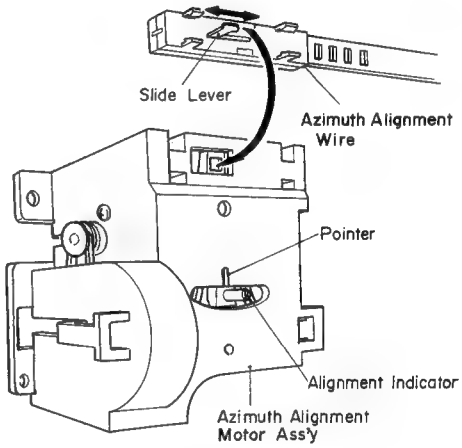


Fig. 4.19

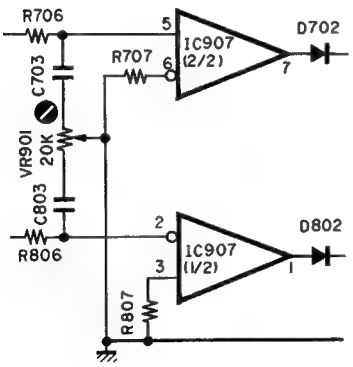


Fig. 4.20

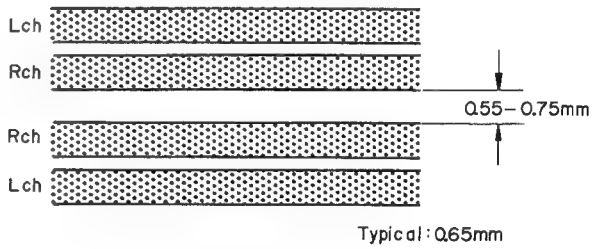


Fig. 4.21

4.9. Record Head Stroke Adjustment

Refer to Figs. 4.22 and 4.23.

Note: This adjustment will be required only to insure freedom from misalignment of the record head stroke in the record head stroke check mode.

(1) Check the accuracy of the record head stroke.

(2) Remove Head Mount Base Ass'y referring to item 2.31.

(3) Remove the record head assembly.

(4) Adjustment of Record Head Mounting Gauge M-9048 (DA09048A)
   (a) Mount the Block B onto the Mounting Gauge Plate.
   (b) Loosen the 2 screws fixing the Block A.
   (c) As shown in Fig. 4.22 hold the Gauges (3.05 mm and 0.1 mm thickness) between the Block A and Block B, and fix the Block A with screws, pushing the Block A to the 2 guide pins.

(5) Remove the Block B from the Mounting Gauge Plate.

(6) As shown in Fig. 4.23, mount the R-8L record head assembly onto the Mounting Gauge Plate, then check the location of the R-8L record head surface. (If record head contacts to the Block C, loosen 2 pcs. of screws that assemble record head and record head plate, then place the R-8L record head assembly onto the Plate.)

(7) Remove the R-8L record head assembly from the Mounting Gauge Plate.

(8) Readjustment of Record Head Mounting Gauge M-9048 (DA09048A)
   (a) Mount the Block B onto the Mounting Gauge Plate.
   (b) Loosen the 2 screws fixing the Block A.
   (c) As shown in Fig. 4.22 hold the Gauges (3.05 mm and either one of 0.05, 0.15, 0.2, 0.25, 0.3 or 0.35 mm thickness) between the Block A and Block B, and fix the Block A with screws, pushing the Block A to the 2 guide pins.

(9) Remove the Block B from the Mounting Gauge Plate.

(10) Mount the R-8L record head assembly onto the Mounting Gauge Plate.

(11) As shown in the Fig. 4.23, loosen 2 pcs. of screws that assemble record head and record head plate. As the location of the Block A is secured by the item (8)-(c), push the record head to the directions A and B, then tighten 2 pcs. of screws.

(12) Check to insure freedom from gap between the Block C and record head surface, then tighten the 2 pcs. of screws on the record head assembly with lock tight paint.

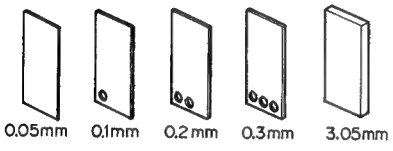
(13) Remove the R-8L record head assembly from the Mounting Gauge Plate.

(14) Assemble the record head assembly to the head mount base assembly.

(15) Assemble the head mount base assembly to the mechanism assembly.

(16) Check the record head stroke.

If the above are inaccurate, items (1) through (16) will have to be repeated till satisfactory results are obtained.



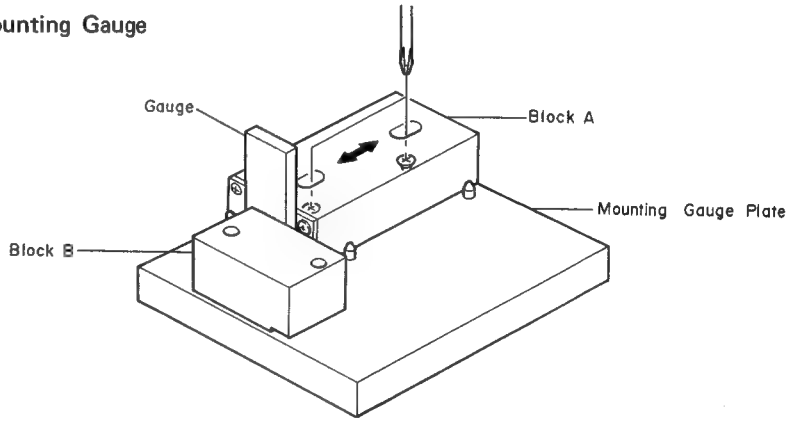


Fig. 4.22

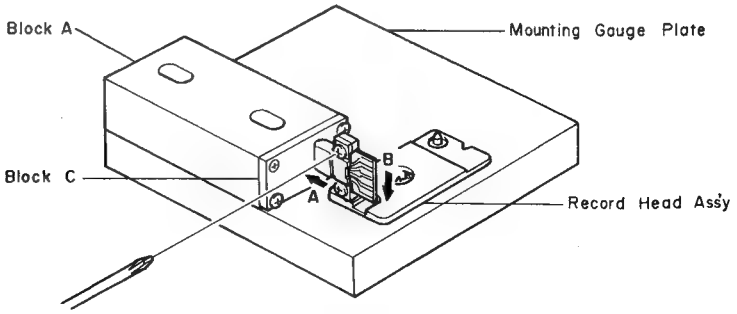


Fig. 4.23

4.10. Tape Travelling Adjustment

The adjustment shall be made with a modified version of the current type EXII C-90 as shown in Fig. 4.24 (error will be made if a current type Tape Travelling Cassette (DA09011A) should be used for this purpose).

While modifying an EXII C-90, the tape guides in the cassette housing shall be kept protected to avoid tilt. Check shall be made in the following procedures:

(1) An EXII C-90 tape thus modified shall be loaded onto the N-681ZX.
(2) Release the back-tension (rotate the Supply Reel and feed out some length of tape) and set the N-681ZX in Play mode.
(3) In this juncture, check to insure whether the tape is free from waving or slippage from the tape guide.
(4) When the modified EXII C-90 is played back, check to insure whether the tape is freedom from waving from head surface or at pressure rollers.
(5) If either of waving or slippage from the tape guide should be noted, adjustments of "4.3. Record Head and Playback Head Tilt Adjustment", "4.4. Head Base Stroke Adjustment", "4.5. Tape Guides Adjustment and Erase Head Stroke Adjustment", "4.6. Erase Head Height and Tilt Adjustment", "4.7. Back Tension Adjustment", "4.8. Playback Head and Record Head Height Adjustment and Azimuth Alignment", "4.9. Record Head Stroke Adjustment", etc. will be required.

As a case may be, the said waving or slippage may have been caused from defective Supply Pressure Roller Ass'y or Take-up Pressure Roller Ass'y without parallel contact with capstans. If such are noted, the Pressure Roller Assemblies will have to be replaced.

Further, excessively weak take-up torque or strong take-up torque may cause defective tape travelling.

The N-681ZX is intended to be an adjustment-free model, however if the similar matters as above should be noted, please replace the Reel Hub Ass'y to obtain appropriate take-up torque.

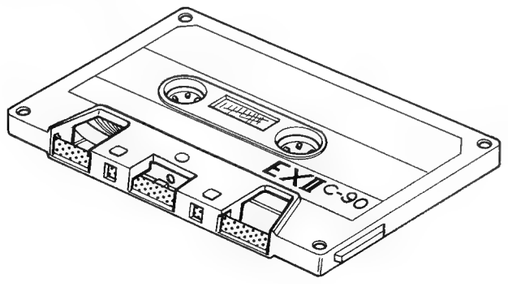


Fig. 4.24

4.11. Record Switch Linkage Adjustment

(1) Set the N-681ZX in Stop mode.
(2) Loosen the Screw of the Record Spring Holder, and shift the Record Spring Holder in order to remove the looseness of the Linkage Wire as shown in Fig. 4.25. Then tighten the Screw for fixing the Record Spring Holder. (In this case, the Record Switch should be positioned at Play side. If in the Record position, it will be defective.)
(3) Set the N-681ZX in Record and Pause mode. Check to insure that the gap between the top of the wire and the Record Spring Holder is approx. 1 mm as shown in Fig. 4.26.
(Check that the Record Switch is in Record position.)
(4) Upon completion of the above adjustments, apply a quantity of lock tight paint to the screw.

4.12. Flywheel Holder Adjustment

(1) Refer to Fig. 4.27.
Tighten the Thrust Screws until the gap between the Flywheel Assemblies and Thrust Screws becomes minimized when both of the Capstan Shafts are moved backwardly and forwardly (the Thrust Springs between the Capstan Flanges and Flywheel Thrust Caps are in a flat state).
Excessive tightening of the Thrust Screws however will give damages on the Flywheel Assemblies, to which careful attention is invited.
(2) Return the Thrust Screws by 1/2 turn.
(3) Fixing the Thrust Screws with a screwdriver, lock the Lock Nut.
(4) Apply a quantity of lock tight paint to the Thrust Screws.

4.13. Lubrication

N-681ZX is a lubrication-free cassette deck except when parts are replaced. Apply the following lubricant for each replaced part:

(1) LAUNA #100
Capstan Shaft
Pressure Roller Shaft
Thrust Cap
(2) FLOIL GB-TS-1
Reel Hub Shaft
Thrust portion on the Capstan Shaft
FLOIL GB-TS-1, made by Kanto Chemicals Co., Ltd. in Japan.
We suggest that you use the above or equivalent type. If unavailable please contact Kanto Chemicals Co., Ltd., 2-7 Kanda Sude-cho Chiyoda-ku, Tokyo 101 Japan.
(3) Silicon Oil #3000 CST
Air Damper Piston
Note: Excessive lubrication may cause defective damper action as the 0.2^{ϕ} hole at the end of the cylinder may be filled with oil.

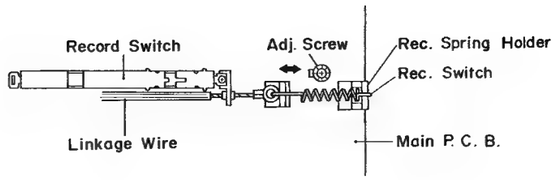


Fig. 4.25

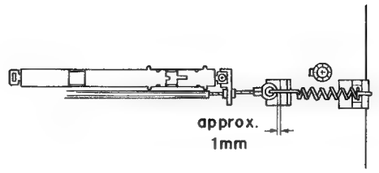


Fig. 4.26

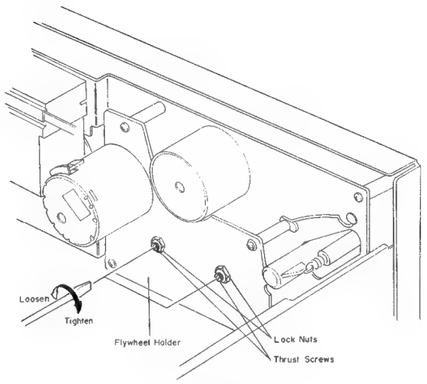
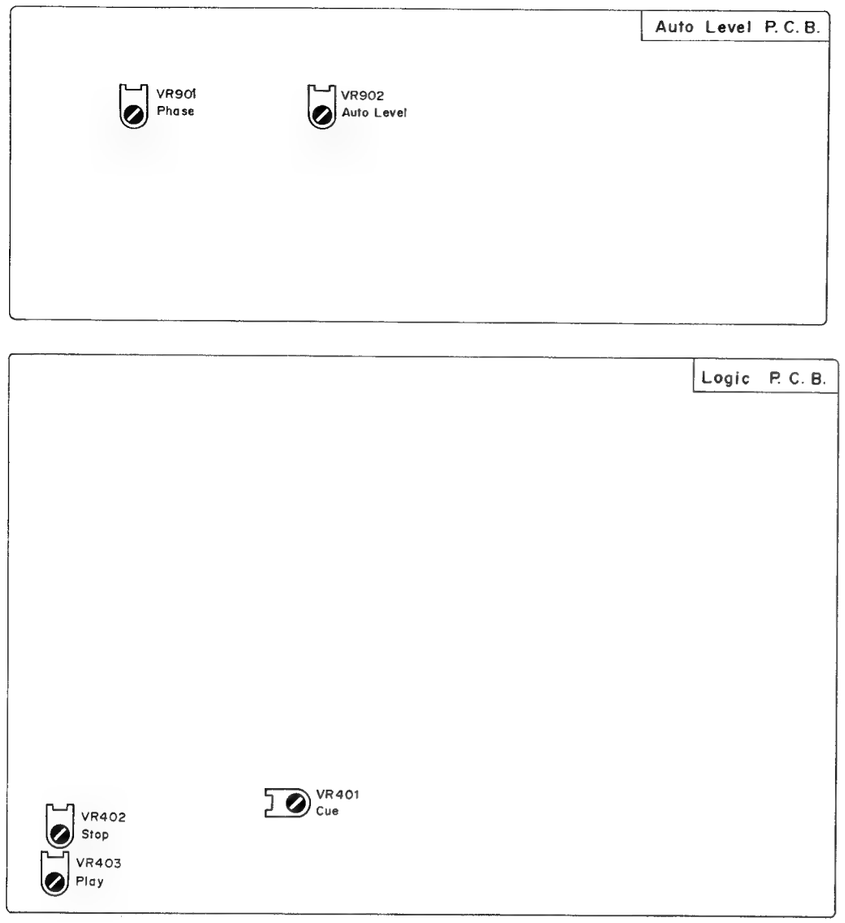
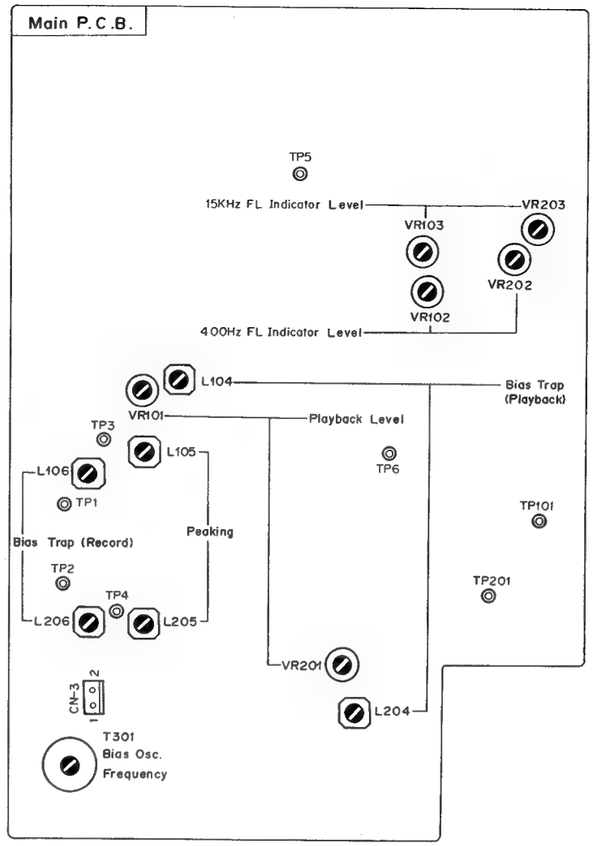
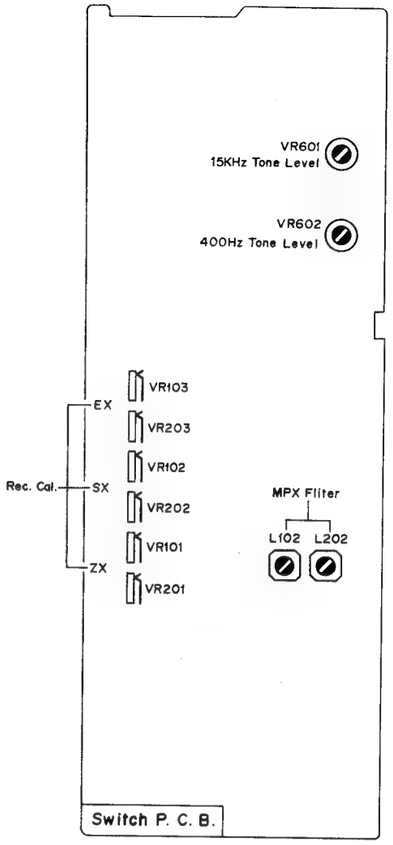


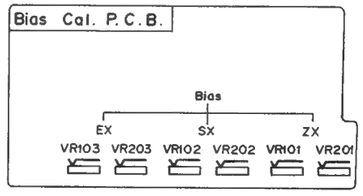
Fig. 4.27

5. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT









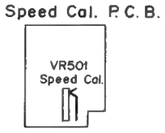


Fig. 5

6. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

6.1. Adjustment and Measurement Instructions

Note: Electrical adjustment should be performed after mechanical adjustment is completed.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Tape Speed Adjustment	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Frequency Counter to Output Jacks	Playback	Speed Cal. P.C.B. VR501	Adjust VR501 to obtain 3 kHz ±0.5%.
2	Tone Level Calibration	Test Tone 400 Hz and 15 kHz	VTVM to TP101, TP201 on Main P.C.B. and Output Jacks	Record, Pause Test Tone SW — 400 Hz/15 kHz	Switch P.C.B. VR602 (400 Hz) VR601 (15 kHz)	1. Set the Test Tone switch to 400 Hz. 2. Adjust VR602 to obtain 90 mV on the VTVM at TP101 (TP201). 3. Measure the reading on the VTVM at the Output Jacks. 4. Set the Test Tone switch to 15 kHz. 5. Adjust VR601 to obtain 20 dB lower level than in 3 on the VTVM at Output Jacks.
3	FL Indicator Level Calibration	400 Hz (0 dB) and 15 kHz (—20 dB) to Input Jacks	VTVM to TP101, TP201 on Main P.C.B.	Record, Pause / Record and Playback Test Tone SW — OFF MPX SW — OFF	Main P.C.B. VR102, VR202 (400 Hz) VR103, VR203 (15 kHz)	1. Load a reference SX tape (DA09025A). 2. Set the N-681ZX in Record/Pause mode. 3. Feed in 400 Hz, then adjust the Input Level controls to obtain 90 mV —0.8 dB on the VTVM. 4. Adjust VR102 (VR202) so that the 0 dB segment of the FL level indicator starts illuminating. 5. Connect IC303-5 and IC303-14 (+12 V) on the Main P.C.B. Ass'y with a jumper wire (meter amp. gain increases by 20 dB). 6. Feed in 15 kHz, then record, rewind and play it back. Adjust the Input Level controls to obtain 9 mV —0.8 dB on the VTVM. 7. Adjust VR103 (VR203) so that the 0 dB segment of the FL level indicator starts illuminating. 8. Remove the jumper wire from IC303-5 and IC303-14.
4	MPX Filter Adjustment	19 kHz ±100 Hz to Input Jacks	VTVM to Output Jacks	Record, Pause Test Tone SW — OFF Dolby NR SW — OFF MPX SW — OUT/IN	Switch P.C.B. L102, L202	1. Turn the Output Level control fully clockwise (maximum position). 2. Adjust the Input Level control to obtain 1 V on the VTVM. 3. Set the MPX switch to IN, then adjust L102 (L202) to obtain minimum reading on the VTVM (minimum reading will be less than —30 dB).
5	Playback Head Track Alignment	1 kHz Track Alignment Tape (DA09007A)	VTVM to Output Jacks	Playback Monitor SW — Tape Tape SW — SX Eq. SW — 70 μs Test Tone SW — OFF Dolby NR SW — OFF MPX SW — OUT	PH Height Gear	Adjust PH Height Gear to obtain minimum readings of both channels on the VTVM. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 4.8.
6	Playback Head Azimuth Alignment	15 kHz Azimuth Tape (DA09004A)	VTVM to Output Jacks	Same as above	Playback Head Azimuth Alignment Screw	Adjust the Playback Head Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM. Refer to "Playback Head Height Adjustment and Azimuth Alignment" in item 4.8. Note: Repeat steps 5 and 6 one or two times to obtain optimum performance.
7	Playback Level Calibration	400 Hz Level Tape (DA09005A)	VTVM to TP101, TP201 on Main P.C.B.	Same as above	Main P.C.B. VR101, VR201	Adjust VR101 (VR201) to obtain 90 mV on the VTVM.

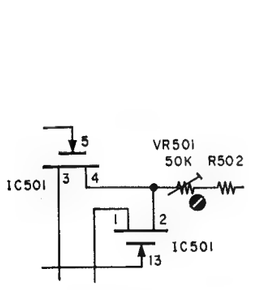


Fig. 6.1
1. Tape Speed

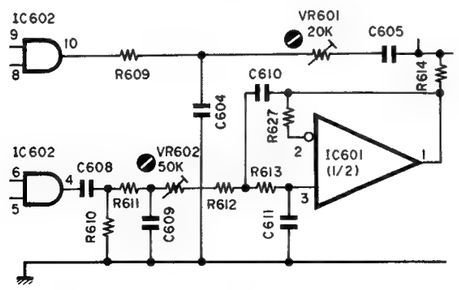


Fig. 6.2
2. Tone Level

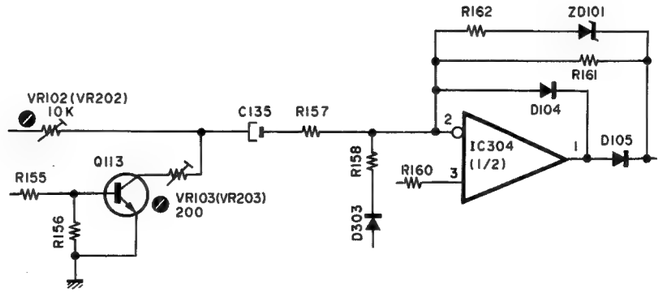


Fig. 6.3
3. FL Indicator Level

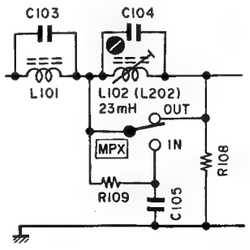


Fig. 6.4
4. MPX Filter

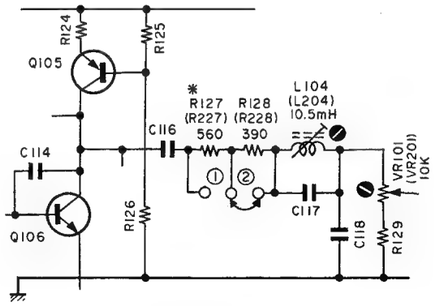


Fig. 6.5
7. Playback Level

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
8	Playback Frequency Response Adjustment	400 Hz Level Tape (DA09005A) 10 kHz PB Frequency Response Tape (DA09003A) 15 kHz PB Frequency Response Tape (DA09002A) 20 kHz PB Frequency Response Tape (DA09001A)	VTVM to Output Jacks	Playback Tape SW — SX Eq. SW — 70 μ Test Tone SW — OFF Dolby NR SW — OFF MPX SW — OUT	Main P.C.B. R127, R227 R128, R228	1. Load a 400 Hz level tape and play it back. Adjust the Output Level control to a certain level (for example 0 dB). 2. Load 10 kHz, 15 kHz and 20 kHz PB frequency response tapes and adjust the playback head azimuth to obtain maximum levels on the VTVM with each tape. Short R127 (R227) or R128 (R228) to obtain the following levels against the 400 Hz level tape. 10 kHz: −20 dB −1 dB to +2 dB 15 kHz: −20 dB −1 dB to +3 dB 20 kHz: −20 dB −1 dB to +4 dB 3. Conduct step 6 "Playback Head Azimuth Alignment". 4. If above is not sufficient, refer to "Playback Frequency Response Adjustment" in item 6.2.
9	Bias Oscillation Frequency and Erase Current Adjustment		VTVM across an additional 0.1 Ω resistor and Frequency Counter to CN3-1	Record, Pause Tape SW — ZX Eq. SW — 70 μs Test Tone SW — OFF Dolby NR SW — OFF MPX SW — OUT	Main P.C.B. T301 R319, R320	1. Connect an additional 0.1 Ω resistor in series to the Erase Head, then connect a VTVM across it. 2. Adjust T301 to obtain 105 kHz on the frequency counter. 3. Check the erase current by the VTVM. Erase current will be in a range of 310 mA to 400 mA (typically approx. 350 mA). If erase current is not sufficient, increase it by shorting R319 or R320. 4. After completion of the erase current adjustment, re-check the bias oscillation frequency. 5. Remove the additional 0.1 Ω resistor.
10	Record Amplifier Equalizer Adjustment	23 kHz (−20 dB) to Input Jacks	VTVM to TP1, TP2 on Main P.C.B.	Same as above	Main P.C.B. L105, L205	1. Remove the bias-cut-jumper from the dip side of the Main P.C.B. Ass'y. 2. Adjust L105 (L205) to obtain peak reading at 23 kHz on the VTVM. 3. Re-solder the bias-cut-jumper.
11	Bias Trap Adjustment (Record Amp.)	Remove input signals	VTVM to TP3, TP4 on Main P.C.B.	Same as above	Main P.C.B. L106, L206	Adjust L106 (L206) to obtain minimum reading on the VTVM.
12	Bias Trap Adjustment (Playback Amp.)	Remove input signals	VTVM to L7M, R7M on Main P.C.B.	Same as above	Main P.C.B. L104, L204	Adjust L104 (L204) to obtain minimum reading on the VTVM.

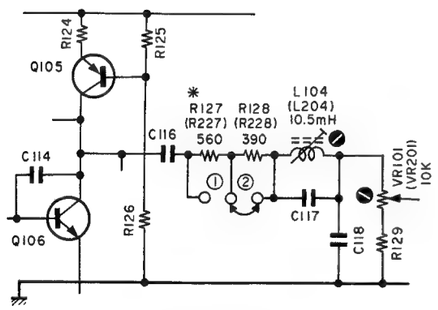


Fig. 6.6
8. Playback Frequency Response
12. Bias Trap (Playback Amp.)

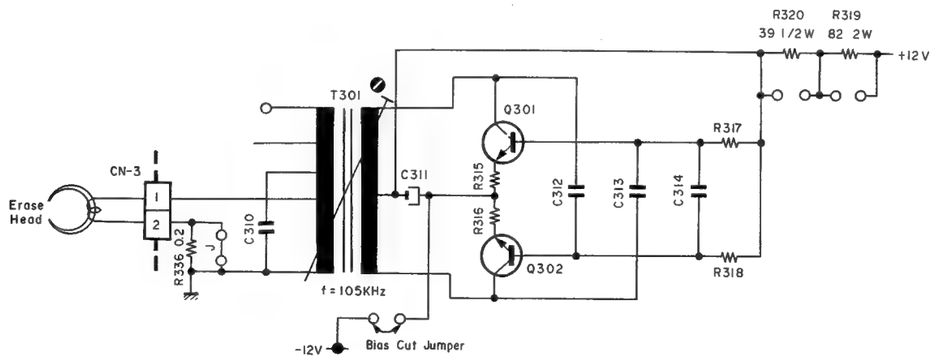


Fig. 6.7
9. Bias Oscillation Frequency and Erase Current

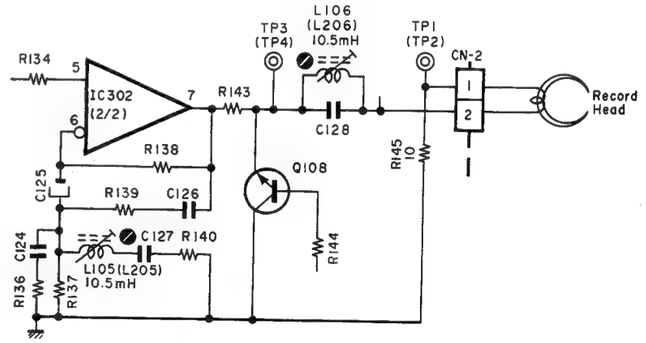


Fig. 6.8
10. Record Amp. Equalizer
11. Bias Trap (Record Amp.)

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
13	Record Head Height Adjustment and Azimuth Alignment	Test Tone 400 Hz and 15 kHz	VTVM to Playback Eq. Amp. Outputs: Terminal L7M, R7M on Main P.C.B. or Terminal 1, 3 on Auto Level P.C.B.	Record, Playback Tape SW — SX Eq. SW — 70 μs Test Tone SW — 400 Hz/15 kHz Dolby NR SW — OFF MPX SW — OUT	Head Height: RH Height Gear Azimuth Alignment: Record Head Azimuth Alignment Screw Switch P.C.B. VR102, VR202 Bias Cal. P.C.B. VR102, VR202 Auto Level P.C.B. VR901	1. In Stop mode, turn the Azimuth Motor by hand so that the Alignment Indicator corresponds to the pointer of the Azimuth Alignment Motor Ass'y as shown in Fig. 4.18. Remove the Azimuth Alignment Wire by pulling out from the Azimuth Alignment Motor Ass'y. (In this case, do not move the Slide Lever of the Azimuth Alignment Wire.) Ground IC902-13 and IC903-1 on the Auto Level P.C.B. Ass'y with jumper wires. 2. Record Head Height Adjustment: a. Set the Test Tone switch to 400 Hz. Record signals on a reference SX Tape (DA09025A), and then play it back. b. Adjust Record Cal. VR102 (VR202) on the Switch P.C.B. Ass'y and Bias Cal. VR102 (VR202) on the Bias Cal. P.C.B. Ass'y to the center position. c. Adjust the RH Height Gear to obtain maximum readings of both channels on the VTVM. 3. Record Head Azimuth Alignment: a. Set the Test Tone switch to 15 kHz. Record signals on the reference SX tape (DA09025A) and then play it back. b. Adjust the Record Head Azimuth Alignment Screw to obtain maximum readings of both channels on the VTVM. c. Repeat 2 and 3 one or two times to obtain optimum performance. 4. Press the Stop button, then perform the Auto Azimuth Alignment function as follows: a. Press the Record and Pause buttons. b. Pressing the Auto Calibration button, press the Play button. The Auto Calibration Indicator starts flashing. c. During the Auto Azimuth Alignment operation, adjust VR901 on the Auto Level P.C.B. Ass'y so that the Azimuth Motor stops its rotation. 5. Press the Stop button, then mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y referring to Fig. 4.19. Remove the jumper wires from IC902-13 and IC903-1 on the Auto Level P.C.B. Ass'y.

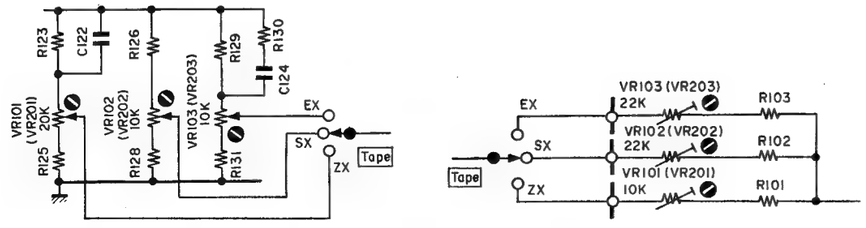


Fig. 6.9
13. Record Head Height and Azimuth

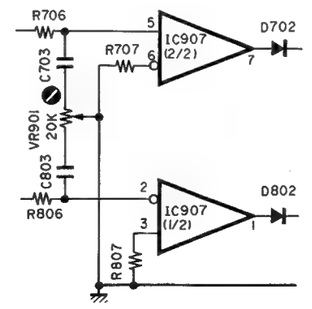


Fig. 6.10
13. Record Head Height and Azimuth

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
14	Record Level Calibration and Recording Bias Current Adjustment	Test Tone 400 Hz and 15 kHz	VTVM to TP101, TP201 on Main P.C.B. and Distortion Meter to Output Jacks	Record, Playback Tape SW — ZX/SX/EX Eq. SW — 70 μs (ZX/SX) 120 μs (EX) Test Tone SW — 400 Hz/15 kHz Dolby NR SW — OFF MPX SW — OFF	Switch P.C.B. (Record Cal.) ZX: VR101, VR201 SX: VR102, VR202 EX: VR103, VR203 Bias Cal. P.C.B. (Bias Current) ZX: VR101, VR201 SX: VR102, VR202 EX: VR103, VR203 Auto Level P.C.B. VR902	Adjustment should be made in the order of ZX, SX and EX. 1. Short IC903-1 and IC903-7 (GND), and IC902-12 and IC902-7 (GND) on the Auto Level P.C.B. Ass'y with jumper wires. 2. Remove the 2P connector CN-11 on the Auto Level P.C.B. Ass'y. 3. Turn the Auto Level Motor Pulley by hand so that the left-hand end of the Level Indicator corresponds to the left-hand end of the pointer. Refer to Fig. 6.11. 4. Load a reference ZX tape (DA09037A), reference SX tape (DA09025A) and reference EXII tape (DA09066A). 5. Perform the Auto Calibration function as follows: a. Press the Record and Pause buttons. b. Pressing the Auto Calibration button, press the Play button. The Auto Calibration Indicator starts flashing. c. Press the Stop button approx. 6 seconds later. (Record Head Azimuth Alignment is carried out). 6. Set the Test Tone switch to 15 kHz, then record and play it back. Adjust Bias Cal. VR101 (VR201) for ZX, VR102 (VR202) for SX and VR103 (VR203) for EXII on the Bias Cal. P.C.B. Ass'y to obtain 0 dB on the FL level indicator. 7. Set the Test Tone switch to 400 Hz, then record, rewind and play it back. Adjust Rec. Cal. VR101 (VR201) for ZX and VR102 (VR202) for SX on the Switch P.C.B. Ass'y to obtain 90 mV on the VTVM, and VR103 (VR203) for EXII to obtain 100 mV on the VTVM. 8. Repeat 6 and 7 one or two times to obtain optimum performance. 9. Perform the Auto Level Adjustment as follows by using the Azimuth Alignment Motor Ass'y instead of the Auto Level Motor Ass'y. a. Remove the Azimuth Alignment Wire by pulling out from the Azimuth Alignment Motor Ass'y. b. Remove the 2P connector CN-10 of the Azimuth Alignment Motor Ass'y from the Auto Level P.C.B. Ass'y, then connect it to CN-11 on the Auto Level P.C.B. Ass'y. c. Perform the Auto Calibration function. 1) Press the Record and Pause buttons. 2) Pressing the Auto Calibration button, press the Play button. The Auto Calibration Indicator starts flashing. d. Adjust VR902 on the Auto Level P.C.B. Ass'y so that the Azimuth Motor stops its rotation. e. Remove CN-10 of the Azimuth Alignment Motor Ass'y from CN-11 on the Auto Level P.C.B. Ass'y, then mount it to the original place (CN-10). Mount CN-11 of the Auto Level Motor Ass'y to the original place (CN-11). Mount the Azimuth Alignment Wire on the Azimuth Alignment Motor Ass'y. 10. Remove the jumper wires between IC903-1 and IC903-7, and IC902-12 and IC902-7. 11. Load a reference SX tape (DA09025A), then perform the Auto Calibration function as follows: a. Reset the Tape Counter to "000". b. Press the Record and Pause buttons. c. Pressing the Auto Calibration button, press the Play button. The Auto Calibration Indicator starts flashing. After disappearing flashing, the tape is rewound to "000". d. Set the Test Tone switch to 400 Hz, then record and play it back. Check to insure that the playback level is 0 dB on the FL level indicator for both channels. e. Set the Test Tone switch to 15 kHz, then record and play it back. Check to insure that the playback level is 0 dB on the FL level indicator for both channels. 12. Check whether the total harmonic distortion is less than 0.8% for ZX and 1.0% for SX and EXII.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
15	Overall Frequency Response Adjustment	400 Hz (0 dB) and 20 Hz to 22 kHz/20 kHz (−20 dB) to Input Jacks	VTVM to Output Jacks	Record and Playback Tape SW — ZX/SX/EX Eq. SW — 70 μs (ZX/SX) 120 μs (EX) Test Tone SW — OFF Dolby NR SW — OFF/ B-Type/C-Type MPX SW — OUT	Main P.C.B. L105, L205	Before adjustment, perform the following operation for each tape to be used. a. Reset the Tape Counter to "000" b. Perform the Auto Calibration function. 1) Press the Record and Pause buttons. 2) Pressing the Auto Calibration button, press the Play button. 1. Feed in 400 Hz (0 dB) and adjust the Input Level controls to obtain 0 dB on the FL level indicators. 2. Switch the Generator output level to −20 dB, then record, rewind and play it back. 3. Feed in 20 Hz to 22 kHz (−20 dB) for ZX and 20 Hz to 20 kHz (−20 dB) for SX and EXII, and check to insure if the output levels are within −20 dB ±3 dB with Dolby NR switch OFF. 4. If above is not sufficient, adjust L105 (L205) to obtain approx. −20 dB on the VTVM at 22 kHz. 5. Set the Dolby NR switch to B-Type/C-Type. Feed in 20 Hz to 22 kHz (−20 dB) for ZX and 20 Hz to 20 kHz (−20 dB) for SX and EXII, then check to insure that the levels are within a range of ±2 dB against the levels in Dolby NR switch OFF. 6. Conduct step 14 "Record Level Calibration and Recording Bias Current Adjustment". 7. If above is not sufficient, precise re-adjustment of step B "Playback Frequency Response", replacement of Playback Head or Record Head, or check on item 4.10 "Tape Travelling Adjustment" will be required.
16	Crosstalk Measurement	1 kHz to Input Jacks	1 kHz Band Pass Filter and VTVM to Output Jacks	Record and Playback Tape SW — ZX Eq. SW — 70 μs Test Tone SW — OFF Dolby NR SW — OFF MPX SW — OUT		1. Erase a reference ZX tape (DA09037A) with bulk eraser. 2. Load the tape. 3. Reset the Tape Counter to "000", then perform the Auto Calibration function referring to 15-b. 4. Adjust the Input Level controls to obtain 0 dB on the FL level indicators, and record the signals on the reference tape. 5. Turn the cassette tape the other way round and play it back. 6. Measure the difference between 4 and 5.
17	Channel Separation Measurement	1 kHz to Input Jacks	Same as above	Same as above		1. Erase a reference ZX tape (DA09037A) with bulk eraser. 2. Load the tape. 3. Reset the Tape Counter to "000", then perform the Auto Calibration function referring to 15-b. 4. Adjust the L ch (R ch) Input Level control to obtain 0 dB on the FL level indicators, and close the R ch (L ch) Input Level control. 5. Record, rewind and play it back, then measure the R ch (L ch) level.

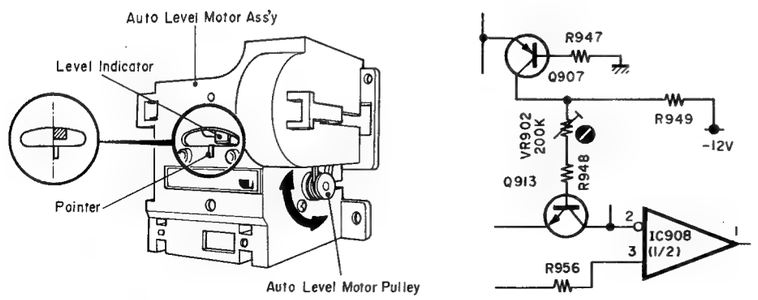


Fig. 6.11
14. Recording Level and Bias Current

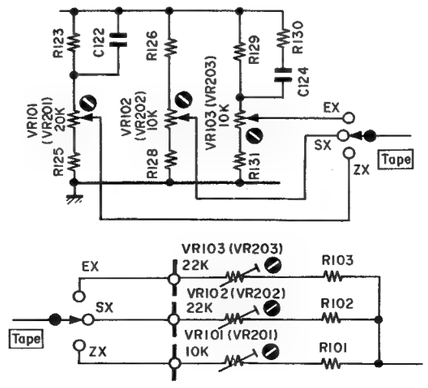


Fig. 6.12
14. Recording Level and Bias Current

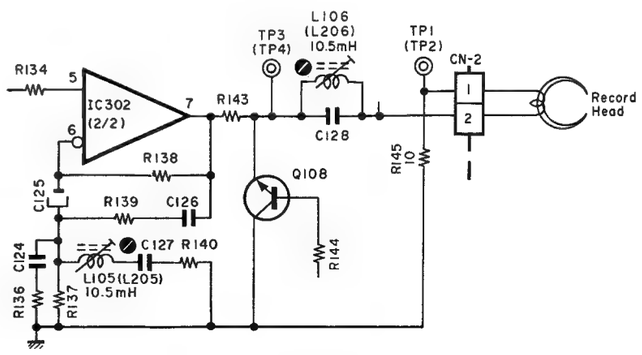


Fig. 6.13
15. Overall Frequency Response

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
18	Erasure Measurement	100 Hz to Input Jacks	100 Hz Band Pass Filter and VTVM to Output Jacks	Record and Playback Tape SW – ZX Eq. SW – 70 μs Test Tone SW – OFF Dolby NR SW – OFF MPX SW – OUT		1. Erase a reference ZX tape (DA09037A) with bulk eraser. 2. Load the tape. 3. Reset the Tape Counter to "000", then perform the Auto Calibration function referring to 15-b. 4. Adjust the Input Level controls to obtain 0 dB on the FL level indicators, and record the signals on the reference tape. 5. Rewind the tape and close the Input Level controls, then record. 6. After rewound, play back and measure the difference between 4 and 5.
19	Signal to Noise Ratio Measurement	400 Hz to Input Jacks	VTVM and Distortion Meter to Output Jacks	Record and Playback Tape SW – ZX Eq. SW – 70 μs Test Tone SW – OFF Dolby NR SW – B-Type/C-Type MPX SW – OUT		1. Reset the Tape Counter to "000", then perform the Auto Calibration function referring to 15-b. 2. Set the Dolby NR switch to B-Type/C-Type. 3. Feed in 400 Hz, then record, rewind and play it back. 4. Adjust the Input Level controls to obtain 3% total harmonic distortion in playback mode. 5. Close the Input Level controls, then record. 6. After rewound, play back and check the output level difference between 4 and 5. Note: The filter of IHF-A curve shall be used in the measurements.
20	Total Harmonic Distortion Measurement	400 Hz to Input Jacks	VTVM and Distortion Meter to Output Jacks	Record and Playback Tape SW – ZX/SX/EX Eq. SW – 70 μs (ZX/SX) 120 μs (EX) Test Tone SW – OFF Dolby NR SW – OFF MPX SW – OUT		1. Reset the Tape Counter to "000", then perform the Auto Calibration function referring to 15-b. 2. Adjust the Input Level controls to obtain 0 dB on the FL level indicators. 3. Record, rewind and play it back. 4. Read the distortion meter and check to insure that the distortion is less than 0.8% for ZX tape and 1.0% for SX and EXII tapes.
21	Wow/Flutter Measurement	3 kHz Speed and Wow/Flutter Tape (DA09006A)	Wow/Flutter Meter to Output Jacks	Playback Eq. SW – 70 μs		Play back and read the wow/flutter meter.

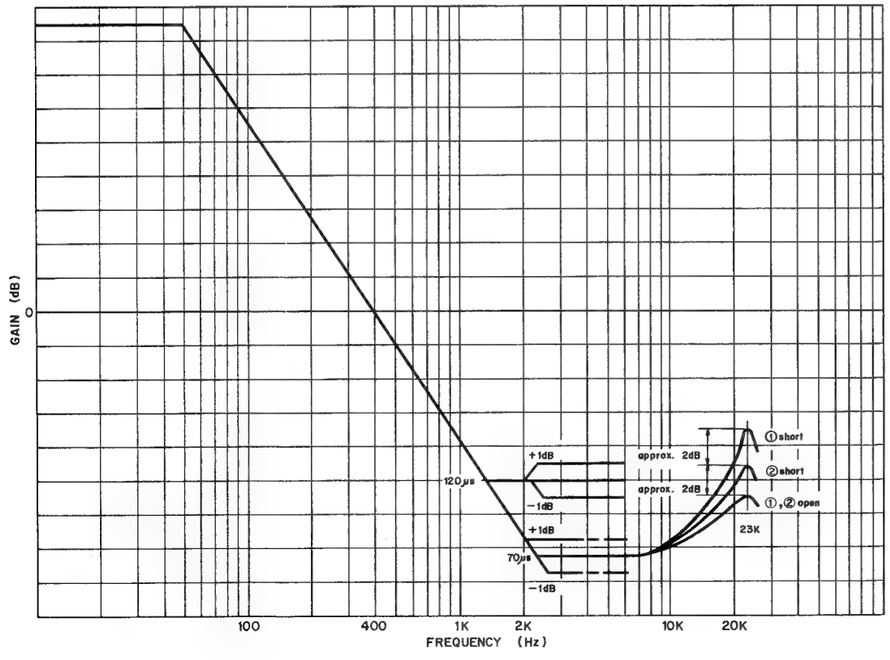


Fig. 6.14 Playback Equalization Curve

6.2. Frequency Response Adjustment

(1) Playback Frequency Response Adjustment

Refer to Figs. 6.14 and 6.15.

(a) Level Adjustment (for middle frequency response)

This adjustment will be required if playback level is not sufficient when 10 kHz PB frequency response tape is played back as referred to step 8 in 6.1. "Adjustment and Measurement Instructions".

Playback equalization level is varied by the modification of R120 (R220) on the Main P.C.B. Ass'y and R112 (R212) on the Dolby NR P.C.B. Ass'y.

Following are the details for level modification:

Approx. +1 dB	R120 (R220):	7.32K
	R112 (R212):	1.96K
0 dB	R120 (R220):	8.06K
	R112 (R212):	2.1K
Approx. –1 dB	R120 (R220):	8.66K
	R112 (R212):	2.37K

(b) Peaking Adjustment (for high frequency response)

This adjustment will be required if playback level is not sufficient when 20 kHz PB frequency response tape is played back as referred to step 8 in 6.1. "Adjustment and Measurement Instructions".

Peaking portion compensates the gap loss of the playback head.

Peaking level is varied by the short circuit of R127 (R227) or R128 (R228) on the Main P.C.B. Ass'y as illustrated in Fig. 6.14.

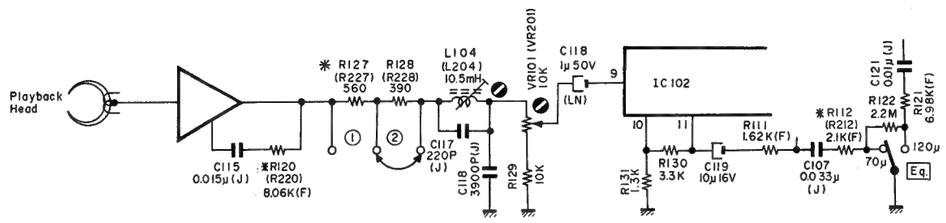


Fig. 6.15 Playback Eq. Amp.

(2) Record Current Frequency Response Adjustment

Record eq. peaking is adjusted for compensating the overall frequency response when playback frequency response is completed.

Normally however, peaking frequency is pre-adjusted to approx. 23 kHz in Record mode. Refer to Fig. 6.16.

(a) For ZX Tape

1) Feed in 400 Hz (0 dB), then record and play it back.
   Adjust bias current by VR101 (VR201) on the Bias Cal. P.C.B. Ass'y to obtain a 0.8% distortion.
2) Feed in 10 kHz and 400 Hz (–20 dB), then record and play it back.
   Check the difference of the levels between 10 kHz and 400 Hz, and mount an additional capacitor in parallel with C120 (C220) on the Switch P.C.B. Ass'y from the dip side of the printed circuit board depending upon the difference of the levels against 400 Hz. Refer to Fig. 6.17.

Level Difference	Addition	Total
0 dB	0	1000 pF
–1 dB	330 pF	1330 pF
–2 dB	680 pF	1680 pF

3) Feed in 22 kHz (–20 dB), then record and play it back.
   Adjust record peaking coil L105 (L205) to obtain flat overall frequency response.

(b) For SX Tape

1) Feed in 15 kHz and 400 Hz (–20 dB), then record and play it back.
   Adjust bias current by VR102 (VR202) on the Bias Cal. P.C.B. Ass'y to obtain flat overall frequency response.
2) Feed in 20 kHz and 400 Hz (–20 dB), then record and play it back.
   And check to insure that the overall frequency response is flat.

(c) For EX Tape

1) Feed in 15 kHz and 400 Hz (–20 dB), then record and play it back.
   Adjust bias current by VR103 (VR203) on the Bias Cal. P.C.B. Ass'y to obtain flat overall frequency response.
2) Feed in 20 kHz and 400 Hz (–20 dB), then record and play it back.
   And check to insure that the overall frequency response is flat.

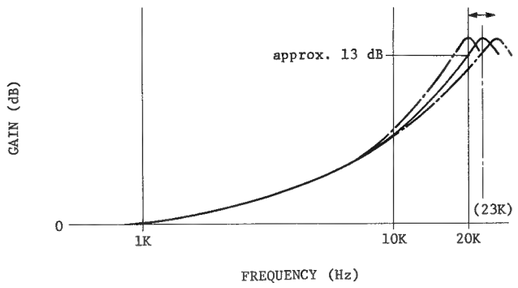


Fig. 6.16

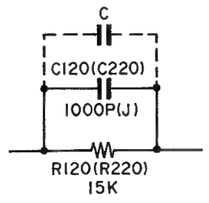


Fig. 6.17

6.3. Dolby NR Circuit Check

Dolby NR circuit incorporates a Dolby NR IC (μA7300-PC) which has no adjustment point.

Perform the following checks and make sure that the IC operates accurately, i.e., accuracy of frequency response through IC.

6.3.1. Dolby NR B-Type Circuit Check

(1) Playback Dolby NR Circuit

Signal Source: 1.4 kHz to CN15-9 (CN14-1) on Dolby NR P.C.B.
Output Connection: VTVM to test point TP101 (TP201) on Main P.C.B.
Mode: Stop
Dolby NR SW – B-Type/OFF

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
(b) Set the Dolby NR switch to B-Type.
   Feed in 1.4 kHz to CN15-9 (CN14-1) and adjust the generator output control to obtain 9 mV on the VTVM.
(c) Set the Dolby NR switch to OFF.
   Check to insure that the reading is +3.2 dB ±1.5 dB on the VTVM.

(2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks
Output Connection: VTVM to test point TP101 (TP201) on Main P.C.B., and IC102-16 (IC202-16) on Dolby NR P.C.B.
Mode: Record/Pause
Dolby NR SW – B-Type/OFF

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
(b) Feed in 1.4 kHz and adjust the Input Level controls to obtain 9 mV/2.85 mV on the VTVM.
(c) Remove the VTVM from TP101 (TP201) and reconnect it to IC102-16 (IC202-16) on the Dolby NR P.C.B. Ass'y.
(d) Check to insure that the reading at IC102-16 (IC202-16) corresponds to the following with Dolby NR switch OFF and B-Type.

Input Level at TP101 (TP201)	Level at IC102-16 (IC202-16)	
	Dolby NR OFF	Dolby NR B-Type
9 mV	0 dB	+3.2 dB ±1.5 dB
2.85 mV	0 dB	+8.2 dB ±1.5 dB

6.3.2. Dolby NR C-Type Circuit Check

(1) Playback Dolby NR Circut

Signal Source: 1.4 kHz to CN15-9 (CN14-1) on Dolby NR P.C.B.
Output Connection: VTVM to test point TP101 (TP201) on Main P.C.B.
Mode: Stop
Dolby NR SW – C-Type/OFF

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
(b) Set the Dolby NR switch to C-Type.
   Feed in 1.4 kHz to CN15-9 (CN14-1) and adjust the generator output control to obtain 9 mV on the VTVM.
(c) Set the Dolby NR switch to OFF.
   Check to insure that the reading is +6.5 dB ±1.5 dB on the VTVM.

(2) Record Dolby NR Circuit

Signal Source: 1.4 kHz to Input Jacks
Output Connection: VTVM to test point TP101 (TP201) on Main P.C.B., and IC102-16 (IC202-16) on Dolby NR P.C.B.
Mode: Record/Pause
Dolby NR SW – C-Type/OFF

(a) Connect a VTVM to TP101 (TP201) on the Main P.C.B. Ass'y.
(b) Feed in 1.4 kHz and adjust the Input Level controls to obtain 9 mV/2.85 mV on the VTVM.
(c) Remove the VTVM from TP101 (TP201) and reconnect it to IC102-16 (IC202-16) on the Dolby NR P.C.B. Ass'y.
(d) Check to insure that the reading at IC102-16 (IC202-16) corresponds to the following with Dolby NR switch OFF and C-Type.

Input Level at TP101 (TP201)	Level at IC102-16 (IC202-16)	
	Dolby NR OFF	Dolby NR C-Type
9 mV	0 dB	+6.5 dB ±1.5 dB
2.85 mV	0 dB	+11.4 dB ±1.5 dB

7. MOUNTING DIAGRAMS AND PARTS LIST

Schematic Ref. No.	Part No.	Description	
	BA04095A	**Fuse P.C.B. Ass'y (U.S.A. & Canada)**	
	0B07842C	Fuse P.C.B.	
F1,2,3	0B08374A	Fuse 1A 250V	
	0B08342A	Spark Killer	(1 pce.)
	0M04078B	Fuse Label 1A 250V x 2	(1 pce.)
	0M03782A	Fuse Label 1A 250V	(1 pce.)
	0J03834C	Fuse P.C.B. Holder	(1 pce.)
	0E00606A	Screw M3x6 Philips Pan Head (3A)	(2 pcs.)
	0E00752A	Eyelet 2x3	(6 pcs.)
	BA04096A	**Fuse P.C.B. Ass'y (Japan)**	
	0B07842C	Fuse P.C.B.	
F1,2,3	0B08686A	Fuse 1A 250V	
	0B08363A	Spark Killer	(1 pce.)
	0M04078B	Fuse Label 1A 250V x 2	(1 pce.)
	0M03782A	Fuse Label 1A 250V	(1 pce.)
	0J03834C	Fuse P.C.B. Holder	(1 pce.)
	0E00606A	Screw M3x6 Philips Pan Head (3A)	(2 pcs.)
	0E00752A	Eyelet 2x3	(6 pcs.)
	BA04097B	**Fuse P.C.B. Ass'y (Others)**	
	0B07842C	Fuse P.C.B.	
F1,2,3	0B08263A	Fuse T 315mA 250V	
F4,5	0B08347U	Fuse T 1A 250V	
	0B08349A	Fuse Clip	(10 pcs.)
	0B08240A	Spark Killer	(1 pce.)
	0M04073A	Fuse Label 315mA 250V	(1 pce.)
	0M04131B	Fuse Label 1A 250V x 2	(1 pce.)
	0M04074B	Fuse Label 315mA 250V x 2	(1 pce.)
	0J03834C	Fuse P.C.B. Holder	(1 pce.)
	0E00606A	Screw M3x6 Philips Pan Head (3A)	(2 pcs.)
	0E00752A	Eyelet 2x3	(6 pcs.)
	BA04098B	**Fuse P.C.B. Ass'y (UK & Australia)**	
	0B07842C	Fuse P.C.B.	
F1	0B08665A	Fuse T 160mA 250V	
F2,3	0B08263A	Fuse T 315mA 250V	
F4,5	0B08347U	Fuse T 1A 250V	
	0B08349A	Fuse Clip	(10 pcs.)
	0B08240A	Spark Killer	(1 pce.)
	0M04066B	Fuse Label 160mA 250V	(1 pce.)
	0M04131B	Fuse Label 1A 250V x 2	(1 pce.)
	0M04074B	Fuse Label 315mA 250V x 2	(1 pce.)
	0J03834C	Fuse P.C.B. Holder	(1 pce.)
	0E00606A	Screw M3x6 Philips Pan Head (3A)	(2 pcs.)
	0E00752A	Eyelet 2x3	(6 pcs.)
	BA04105B	**Fuse P.C.B. Ass'y (220V Class 2)**	
	0B07842C	Fuse P.C.B.	
F1	0B08665A	Fuse T 160mA 250V	
F2,3	0B08263A	Fuse T 315mA 250V	
F4,5	0B08347U	Fuse T 1A 250V	
	0B08349A	Fuse Clip	(10 pcs.)
	0B08445A	Spark Killer	(2 pcs.)

Note: Mounting diagram shows a dip side view of the printed circuit board.

7.1. Fuse P.C.B. Ass'y

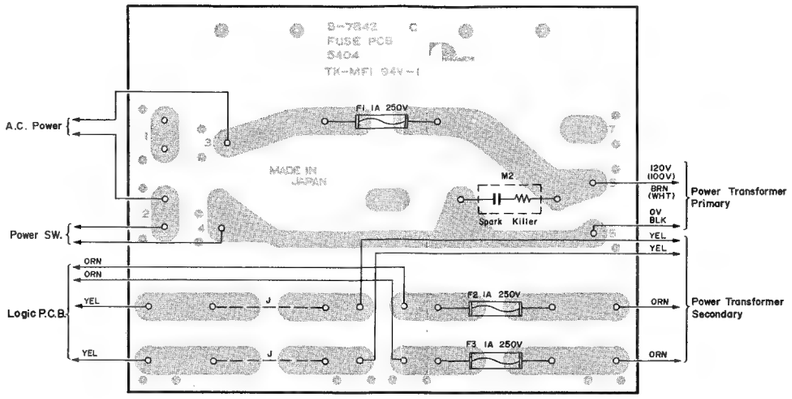


Fig. 7.1.1 U.S.A., Canada & Japan

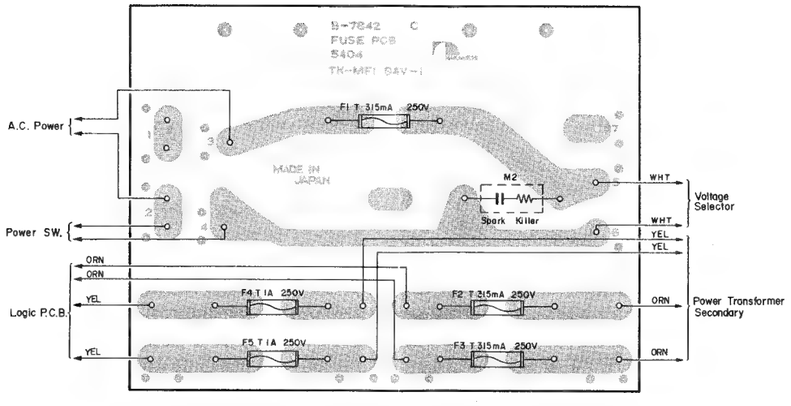


Fig. 7.1.2 Others

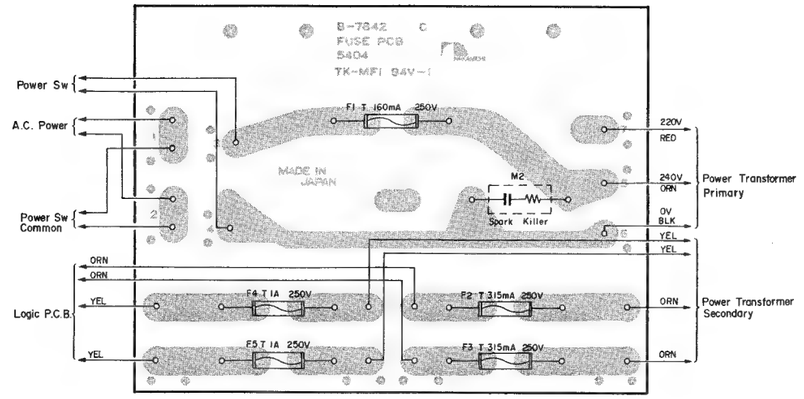


Fig. 7.1.3 UK & Australia

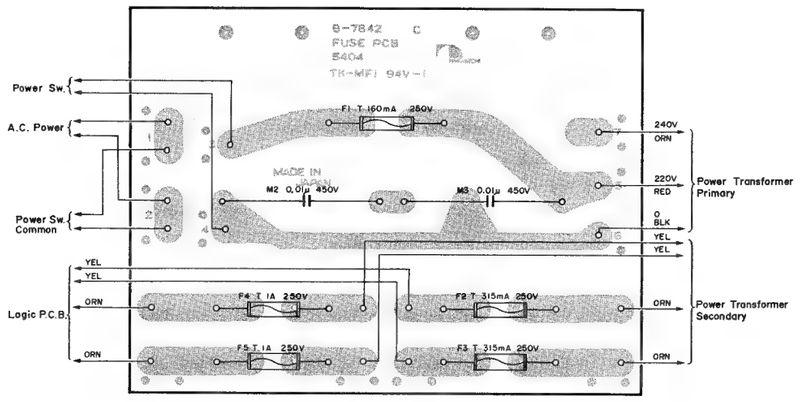


Fig. 7.1.4 220V Class 2

Schematic Ref. No.	Part No.	Description	
	0M04066B	Fuse Label 160mA 250V	(1 pce.)
	0M04131B	Fuse Label 1A 250V x 2	(1 pce.)
	0M04074B	Fuse Label 315mA 250V x 2	(1 pce.)
	0J03834C	Fuse P.C.B. Holder	(1 pce.)
	0E00606A	Screw M3x6 Philips Pan Head (3A)	(2 pcs.)
	0E00752A	Eyelet 2x3	(6 pcs.)

7.2. Pin Jack P.C.B. Ass'y

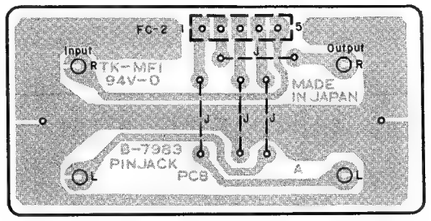


Fig. 7.2

7.3. Volume P.C.B. Ass'y

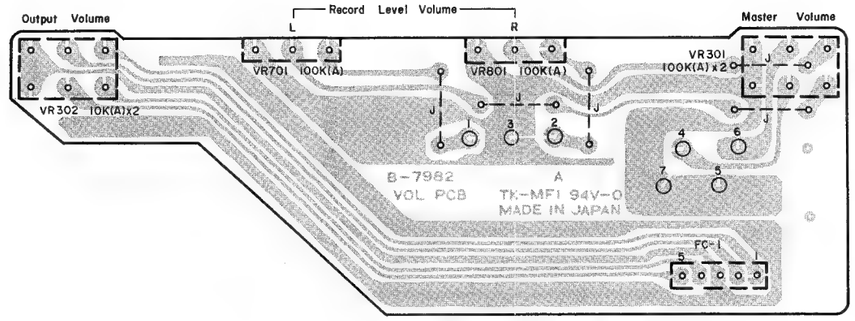


Fig. 7.3

7.4. Calibration Indicator P.C.B. Ass'y

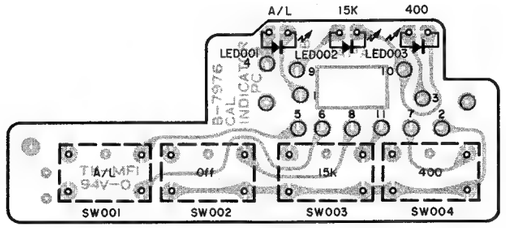


Fig. 7.4

7.5. Bias Cal. P.C.B. Ass'y

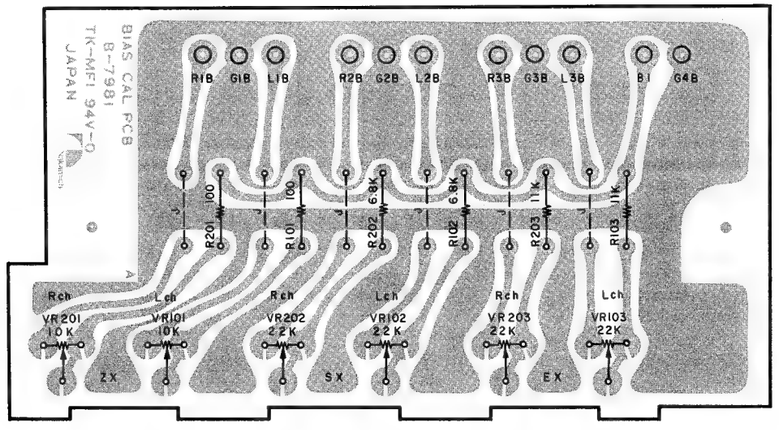


Fig. 7.5

7.6. FL Indicator P.C.B. Ass'y

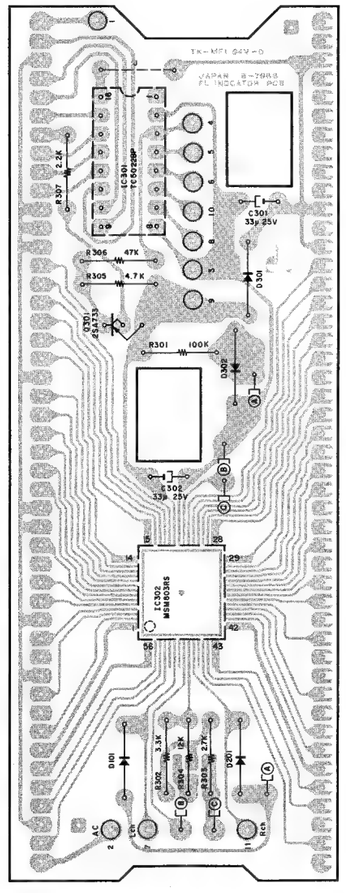


Fig. 7.6 Note: Diode is 1SS53 unless otherwise specified.

7.7. Lamp P.C.B. B Ass'y

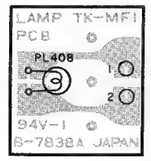


Fig. 7.7

7.8. Lamp P.C.B. C Ass'y

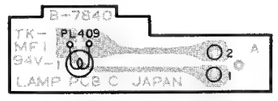


Fig. 7.8

Schematic Ref. No.	Part No.	Description		
	BA04485A	**Pin Jack P.C.B. Ass'y**		
	0B07983A	Pin Jack P.C.B.		
FC2	0B05238A	5P Flat Cable		
	0B08709A	Jack Unit		(1 pce.)
	0E00037A	Earth Lug B-5		(1 pce.)
	BA04469A	**Volume P.C.B. Ass'y**		
	0B07982A	Volume P.C.B.		
VR301	0B07203A	Volume	100K (A) x 2	
VR302	0B07204A	Volume	10K (A) x 2	
VR701,801	0B07202A	Volume	100K (A)	
FC1	0B05238A	5P Flat Cable		
	BA04466A	**Calibration Indicator P.C.B. Ass'y**		
	0B07976B	Calibration Indicator P.C.B.		
LED001, 002,003	0B06306A	LED		
CN9	0B08892A	11P-H Connector		
	0B07354A	Push Switch		(4 pcs.)
	BA04468A	**Bias Cal. P.C.B. Ass'y**		
	0B07981A	Bias Cal. P.C.B.		
VR101,201	0B07319A	Semi-fixed Volume 10K		
VR102,103 202,203	0B07276A	Semi-fixed Volume 22K		
R101,201	0B01679A	Carbon Resistor	100	ERD-25T J
R102,202	0B01682A	Carbon Resistor	6.8K	ERD-25T J
R103,203	0B09334A	Carbon Resistor	11K	ERD-25T J
	BA04459A	**FL Indicator P.C.B. Ass'y**		
	0B07988A	FL Indicator P.C.B.		
IC301	0B06211A	IC	TC5022BP	
IC302	0B06305A	IC	MSM803RS	
Q301	0B06013A	Transistor	2SA733	
D101,201 301,302	0B06181A	Silicon Diode	1SS53	
R301	0B01889A	Carbon Resistor	100K	ERD-25T J
R302	0B01681A	Carbon Resistor	3.3K	ERD-25T J
R303	0B05629A	Carbon Resistor	2.7K	ERD-25T J
R304	0B09263A	Carbon Resistor	12K	ERD-25T J
R305	0B01846A	Carbon Resistor	4.7K	ERD-25T J
R306	0B05641A	Carbon Resistor	47K	ERD-25T J
R307	0B05622A	Carbon Resistor	2.2K	ERD-25T J
C301,302	0B09251A	Electrolytic Capacitor	33μ 25V	
CN8	0B08893A	11P-H Connector B		
	0B08894A	FL Indicator FIP38AW13YS		(1 pce.)
	0J04415A	Free Bushing 70mm		(1 pce.)
	BA04062A	**Lamp P.C.B. B Ass'y**		
	0B07838A	Lamp P.C.B. B		
PL408	0B08586A	Lamp	12V 60mA	
	BA04063A	**Lamp P.C.B. C Ass'y**		
	0B07840A	Lamp P.C.B. C		
PL409	0B08586A	Lamp	12V 60mA	

7.9. Control Switch P.C.B. Ass'y

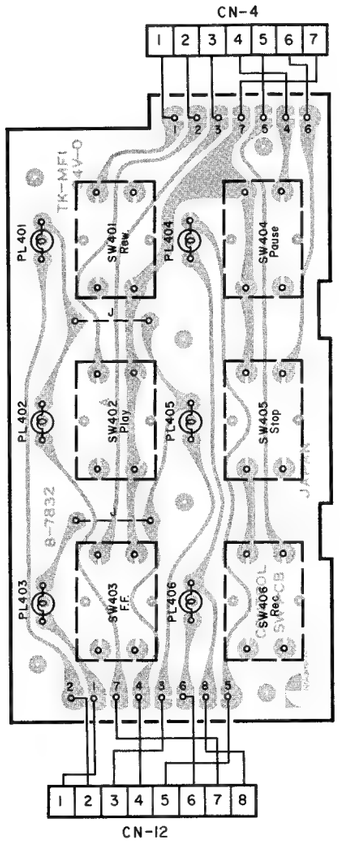


Fig. 7.9

7.10. Shut-off P.C.B. Ass'y

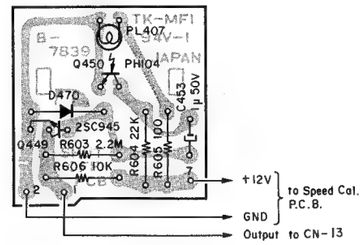


Fig. 7.10

Note: Diode is 1SS53 unless otherwise specified.

7.11. Speed Cal. P.C.B. Ass'y

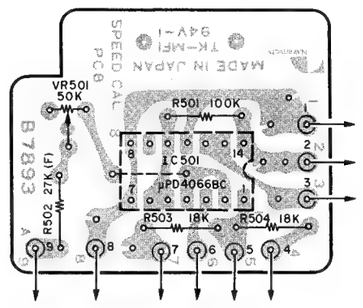


Fig. 7.11

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04071A	**Control Switch P.C.B. Ass'y**		**BA04238A**	**Speed Cal. P.C.B. Ass'y**
	0B07832A	Control Switch P.C.B.		0B07893B	Speed Cal. P.C.B.
SW401-406	0B07219A	Semi-Switch (6 pcs.)	IC501	0B06144A	IC μPD4066BC
PL401-406	0B08552A	Lamp 12V 25mA (6 pcs.)	VR501	0B07269A	Semi-fixed Volume 50K
CN4	0B08631B	7P-H Connector A Ass'y	R501	0B01889A	Carbon Resistor 100K ERD-25T J
CN12	0B08630B	8P-H Connector A Ass'y	R502	0B09444A	Metal Film Resistor 27K SN14K2E F
	BA04070A	**Shut-off P.C.B. Ass'y**	R503,504	0B05560A	Carbon Resistor 18K ERD-25T J
	0B07839B	Shut-off P.C.B.			
Q449	0B01872A	Transistor 2SC945 (L)			
Q450	0B06228A	Photo Transistor PH104			
D470	0B06181A	Silicon Diode 1SS53			
R603	0B05671A	Carbon Resistor 2.2M ERD-25T J			
R604	0B05615A	Carbon Resistor 22K ERD-25T J			
R605	0B09215A	Fail Safe Type Resistor 100 RDF-25S J			
R606	0B01888A	Carbon Resistor 10K ERD-25T J			
C453	0B01405A	Electrolytic Capacitor 1μ 50V			
PL407	0B08552A	Lamp 12V 25mA			

7.12. Switch P.C.B. Ass'y

Note: Diode is 1SS53 unless otherwise specified.

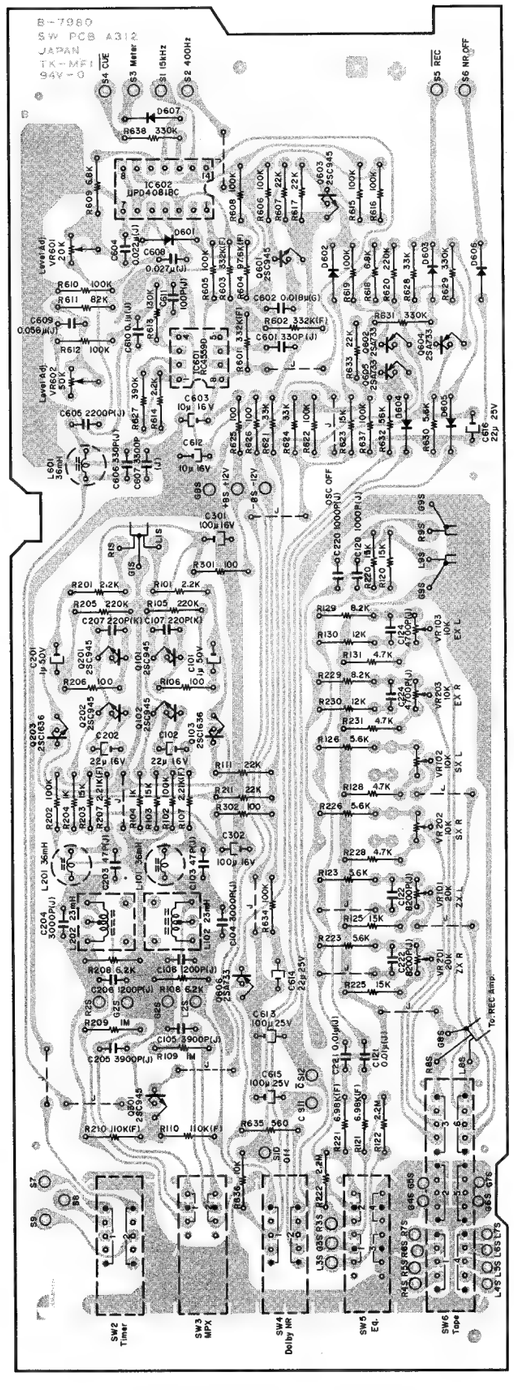


Fig. 7.12.1 Serial No.: A31201908 –

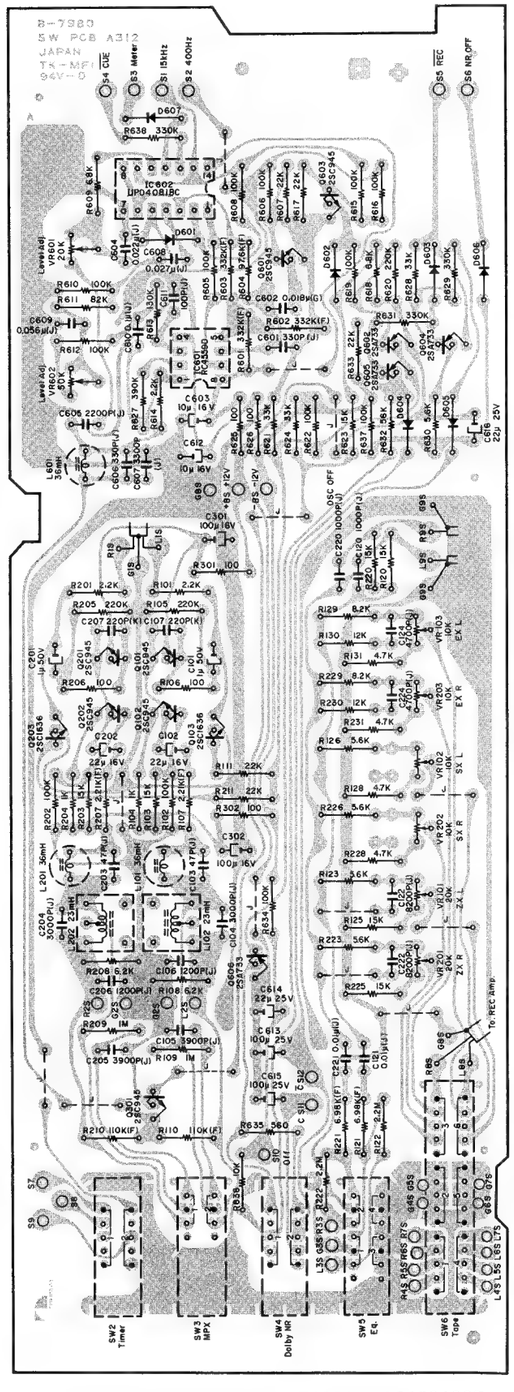


Fig. 7.12.2 Serial Nos.: A31201001 – A31201907

Schematic Ref. No.	Part No.	Description
	BA04460A	**Switch P.C.B. Ass'y** Serial No.: A31201908 –
	– Osc. –	
IC601	0B06127A	IC RC4559D
IC602	0B06219A	IC μPD4081BC
Q601,603	0B06100A	Transistor 2SC945 (A)
Q602	0B06013A	Transistor 2SA733
D601,602	0B06181A	Silicon Diode 1SS53
L601	0B03919B	Inductor 36mH
VR601	0B07270A	Semi-fixed Volume 20K
VR602	0B07269A	Semi-fixed Volume 50K
R601,602 603	0B09315A	Metal Film Resistor 332K SN14K2E F
R604	0B09583A	Metal Film Resistor 97.6K SN14K2E F
R605,606 608,610 612,615 616,619 622	0B01889A	Carbon Resistor 100K ERD-25T J
R607,617	0B05615A	Carbon Resistor 22K ERD-25T J
R609,618	0B01682A	Carbon Resistor 6.8K ERD-25T J
R611	0B05668A	Carbon Resistor 82K ERD-25T J
R613	0B09527A	Carbon Resistor 130K ERD-25T J
R614	0B05622A	Carbon Resistor 2.2K ERD-25T J
R620	0B05625A	Carbon Resistor 220K ERD-25T J
R621,624	0B05509A	Carbon Resistor 33K ERD-25T J
R623	0B01683A	Carbon Resistor 15K ERD-25T J
R625,626	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R627	0B05676A	Carbon Resistor 390K ERD-25T J
C601,606	0B09545A	Mica Capacitor 330P 50V J
C602	0B09584A	PP Capacitor 0.018μ 100V G
C603,612	0B01412A	Electrolytic Capacitor 10μ 16V
C604	0B05582A	Mylar Capacitor 0.022μ 50V J
C605	0B01802A	Mylar Capacitor 2200P 50V J
C607	0B01914A	Mylar Capacitor 3300P 50V J
C608	0B09045A	Mylar Capacitor 0.027μ 50V J
C609	0B05813A	Mylar Capacitor 0.056μ 50V J
C610	0B01780A	Mylar Capacitor 0.1μ 50V J
C611	0B09302A	Mica Capacitor 100P 100V J
	– Input Amp. –	
Q101,102 201,202 301	0B06100A	Transistor 2SC945 (A)
Q103,203	0B06070A	Transistor 2SC1636
L101,201	0B03919B	Inductor 36mH
L102,202	0B03563A	19 kHz Coil 23mH
R101,201	0B05622A	Carbon Resistor 2.2K ERD-25T J
R102,202	0B01889A	Carbon Resistor 100K ERD-25T J
R103,203	0B01683A	Carbon Resistor 15K ERD-25T J
R104,204	0B01857A	Carbon Resistor 1K ERD-25T J
R105,205	0B05625A	Carbon Resistor 220K ERD-25T J
R106,206	0B01679A	Carbon Resistor 100 ERD-25T J
R107,207	0B09547A	Metal Film Resistor 2.21K SN14K2E F
R108,208	0B09271A	Carbon Resistor 6.2K ERD-25T J
R109,209	0B05776A	Carbon Resistor 1M ERD-25T J
R110,210	0B09463A	Metal Film Resistor 110K SN14K2E F
R111,211	0B05615A	Carbon Resistor 22K ERD-25T J
R301,302	0B09215A	Fail Safe Type Resistor 100 RDF-25S J

Schematic Ref. No.	Part No.	Description
C101,201	0B01405A	Electrolytic Capacitor 1μ 50V
C102,202	0B01862A	Electrolytic Capacitor 22μ 16V
C103,203	0B09242A	Mica Capacitor 47P 50V J
C104,204	0B09262A	PP Capacitor 3000P 100V J
C105,205	0B01804A	Mylar Capacitor 3900P 50V J
C106,206	0B05687A	Mylar Capacitor 1200P 50V J
C107,207	0B09283A	Ceramic Capacitor 220P 50V K
C301,302	0B01400A	Electrolytic Capacitor 100μ 16V
	– Rec. Cal. –	
VR101,201	0B07215A	Semi-fixed Volume 20K
VR102,103 202,203	0B07162A	Semi-fixed Volume 10K
R120,125 220,225	0B01683A	Carbon Resistor 15K ERD-25T J
R121,221	0B09537A	Metal Film Resistor 6.98K SN14K2E F
R122,222	0B05671A	Carbon Resistor 2.2M ERD-25T J
R123,126 223,226	0B01887A	Carbon Resistor 5.6K ERD-25T J
R128,131 228,231	0B01846A	Carbon Resistor 4.7K ERD-25T J
R129,229	0B01856A	Carbon Resistor 8.2K ERD-25T J
R130,230	0B09263A	Carbon Resistor 12K ERD-25T J
C120,220	0B05550A	Mylar Capacitor 1000P 50V J
C121,221	0B05681A	Mylar Capacitor 0.01μ 50V J
C122,222	0B05814A	Mylar Capacitor 8200P 50V J
C124,224	0B05652A	Mylar Capacitor 4700P 50V J
	– Miscellaneous –	
	0B07980B	Switch P.C.B.
Q604,605 606	0B06013A	Transistor 2SA733
D603,604 605,606 607	0B06181A	Silicon Diode 1SS53
R628	0B05509A	Carbon Resistor 33K ERD-25T J
R629,631 638	0B05627A	Carbon Resistor 330K ERD-25T J
R630	0B01887A	Carbon Resistor 5.6K ERD-25T J
R632	0B05508A	Carbon Resistor 56K ERD-25T J
R633	0B05615A	Carbon Resistor 22K ERD-25T J
R634,637	0B01889A	Carbon Resistor 100K ERD-25T J
R635	0B05575A	Carbon Resistor 560 ERD-25T J
R636	0B01888A	Carbon Resistor 10K ERD-25T J
C613,615	0B01272A	Electrolytic Capacitor 100μ 25V
C614,616	0B01527A	Electrolytic Capacitor 22μ 25V
SW2,4	0B07384A	Lever Switch 2-3N
SW3	0B07383A	Lever Switch 2-2S
SW5	0B07285A	Lever Switch 4-2S
SW6	0B07304A	Lever Switch 6-3S
	0B08896A	Shield Plate (1 pce.)

Schematic Ref. No.	Part No.	Description
	BA04460A	**Switch P.C.B. Ass'y** Serial Nos.: A31201001 – A31201907
	– Osc. –	
IC601	0B06127A	IC RC4559D
IC602	0B06219A	IC μPD4081BC
Q601,603	0B06100A	Transistor 2SC945 (A)
Q602	0B06013A	Transistor 2SA733
D601,602	0B06181A	Silicon Diode 1SS53
L601	0B03919B	Inductor 36mH
VR601	0B07270A	Semi-fixed Volume 20K
VR602	0B07269A	Semi-fixed Volume 50K
R601,602 603	0B09315A	Metal Film Resistor 332K SN14K2E F
R604	0B09583A	Metal Film Resistor 97.6K SN14K2E F
R605,606 608,610 612,615 616,619 622	0B01889A	Carbon Resistor 100K ERD-25T J
R607,617	0B05615A	Carbon Resistor 22K ERD-25T J
R609,618	0B01682A	Carbon Resistor 6.8K ERD-25T J
R611	0B05668A	Carbon Resistor 82K ERD-25T J
R613	0B09527A	Carbon Resistor 130K ERD-25T J
R614	0B05622A	Carbon Resistor 2.2K ERD-25T J
R620	0B05625A	Carbon Resistor 220K ERD-25T J
R621,624	0B05509A	Carbon Resistor 33K ERD-25T J
R623	0B01683A	Carbon Resistor 15K ERD-25T J
R625,626	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R627	0B05676A	Carbon Resistor 390K ERD-25T J
C601,606	0B09545A	Mica Capacitor 330P 50V J
C602	0B09584A	PP Capacitor 0.018μ 100V G
C603,612	0B01412A	Electrolytic Capacitor 10μ 16V
C604	0B05582A	Mylar Capacitor 0.022μ 50V J
C605	0B01802A	Mylar Capacitor 2200P 50V J
C607	0B01914A	Mylar Capacitor 3300P 50V J
C608	0B09045A	Mylar Capacitor 0.027μ 50V J
C609	0B05813A	Mylar Capacitor 0.056μ 50V J
C610	0B01780A	Mylar Capacitor 0.1μ 50V J
C611	0B09302A	Mica Capacitor 100P 100V J
	– Input Amp. –	
Q101,102 201,202 301	0B06100A	Transistor 2SC945 (A)
Q103,203	0B06070A	Transistor 2SC1636
L101,201	0B03919B	Inductor 36mH
L102,202	0B03563A	19 kHz Coil 23mH
R101,201	0B05622A	Carbon Resistor 2.2K ERD-25T J
R102,202	0B01889A	Carbon Resistor 100K ERD-25T J
R103,203	0B01683A	Carbon Resistor 15K ERD-25T J
R104,204	0B01857A	Carbon Resistor 1K ERD-25T J
R105,205	0B05625A	Carbon Resistor 220K ERD-25T J
R106,206	0B01679A	Carbon Resistor 100 ERD-25T J
R107,207	0B09547A	Metal Film Resistor 2.21K SN14K2E F
R108,208	0B09271A	Carbon Resistor 6.2K ERD-25T J
R109,209	0B05776A	Carbon Resistor 1M ERD-25T J
R110,210	0B09463A	Metal Film Resistor 110K SN14K2E F
R111,211	0B05615A	Carbon Resistor 22K ERD-25T J
R301,302	0B09215A	Fail Safe Type Resistor 100 RDF-25S J

Schematic Ref. No.	Part No.	Description
C101,201	0B01405A	Electrolytic Capacitor 1μ 50V
C102,202	0B01862A	Electrolytic Capacitor 22μ 16V
C103,203	0B09242A	Mica Capacitor 47P 50V J
C104,204	0B09262A	PP Capacitor 3000P 100V J
C105,205	0B01804A	Mylar Capacitor 3900P 50V J
C106,206	0B05687A	Mylar Capacitor 1200P 50V J
C107,207	0B09283A	Ceramic Capacitor 220P 50V K
C301,302	0B01400A	Electrolytic Capacitor 100μ 16V
	– Rec. Cal. –	
VR101,201	0B07215A	Semi-fixed Volume 20K
VR102,103 202,203	0B07162A	Semi-fixed Volume 10K
R120,125 220,225	0B01683A	Carbon Resistor 15K ERD-25T J
R121,221	0B09537A	Metal Film Resistor 6.98K SN14K2E F
R122,222	0B05671A	Carbon Resistor 2.2M ERD-25T J
R123,126 223,226	0B01887A	Carbon Resistor 5.6K ERD-25T J
R128,131 228,231	0B01846A	Carbon Resistor 4.7K ERD-25T J
R129,229	0B01856A	Carbon Resistor 8.2K ERD-25T J
R130,230	0B09263A	Carbon Resistor 12K ERD-25T J
C120,220	0B05550A	Mylar Capacitor 1000P 50V J
C121,221	0B05681A	Mylar Capacitor 0.01μ 50V J
C122,222	0B05814A	Mylar Capacitor 8200P 50V J
C124,224	0B05652A	Mylar Capacitor 4700P 50V J
	– Miscellaneous –	
	0B07980A	Switch P.C.B.
Q604,605 606	0B06013A	Transistor 2SA733
D603,604 605,606 607	0B06181A	Silicon Diode 1SS53
R628	0B05509A	Carbon Resistor 33K ERD-25T J
R629,631 638	0B05627A	Carbon Resistor 330K ERD-25T J
R630	0B01887A	Carbon Resistor 5.6K ERD-25T J
R632	0B05508A	Carbon Resistor 56K ERD-25T J
R633	0B05615A	Carbon Resistor 22K ERD-25T J
R634,637	0B01889A	Carbon Resistor 100K ERD-25T J
R635	0B05575A	Carbon Resistor 560 ERD-25T J
R636	0B01888A	Carbon Resistor 10K ERD-25T J
C613,615	0B01272A	Electrolytic Capacitor 100μ 25V
C614,616	0B01527A	Electrolytic Capacitor 22μ 25V
SW2,4	0B07384A	Lever Switch 2-3N
SW3	0B07383A	Lever Switch 2-2S
SW5	0B07285A	Lever Switch 4-2S
SW6	0B07304A	Lever Switch 6-3S
	0B08896A	Shield Plate (1 pce.)

Schematic Ref. No.	Part No.	Description
	BA04462A	Main P.C.B. Ass'y
		Serial No.: A31201908 –
		– PB Eq. Amp. –
Q104,105	0B06180A	Transistor 2SA970 (GR)
204,205		
Q106,206	0B06142A	Transistor 2SC2240 (BL)
L104,204	0B00068A	Trap Coil 10.5mH
VR101,201	0B07233A	Semi-fixed Volume 10K
R116,216	0B05625A	Carbon Resistor 220K ERD-25T J
R117,217	0B01889A	Carbon Resistor 100K ERD-25T J
R118,218	0B05631A	Carbon Resistor 82 ERD-25T J
R119,219	0B09309A	Carbon Resistor 2.2K ERD-25TS J (Noiseless)
R120,220	0B09431A	Metal Film Resistor 8.06K SN14K2E F
R122,222	0B09310A	Carbon Resistor 33K ERD-25TS J (Noiseless)
R123,223	0B05620A	Carbon Resistor 270K ERD-25T J
R124,224	0B01706A	Carbon Resistor 47 ERD-25T J
R125,225	0B09388A	Carbon Resistor 5.1K ERD-25TS J (Noiseless)
R126,226	0B09311A	Carbon Resistor 68K ERD-25TS J (Noiseless)
R127,227	0B05575A	Carbon Resistor 560 ERD-25T J
R128,228	0B05691A	Carbon Resistor 390 ERD-25T J
R129,229	0B01888A	Carbon Resistor 10K ERD-25T J
R130,131	0B05614A	Carbon Resistor 1.8K ERD-25T J
230,231		
C111,211	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C112,114	0B09281A	Ceramic Capacitor 150P 50V K
212,214		
C113,213	0B09151A	Electrolytic Capacitor 220μ 6.3V (LN)
C115,215	0B05557A	Mylar Capacitor 0.015μ 50V J
C116,216	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C117,217	0B09247A	Mica Capacitor 220P 50V J
C118,218	0B01804A	Mylar Capacitor 3900P 50V J
C119,120	0B01403A	Electrolytic Capacitor 47μ 16V
219,220		
		– Rec. Amp. –
IC302	0B06146A	IC RC4558DD
Q107,108	0B06070A	Transistor 2SC1636
207,208		
D101,102	0B06181A	Silicon Diode 1SS53
103,201		
202,203		
301,302		
L105,106	0B00068A	Trap Coil 10.5mH
205,206		
R133,136	0B01683A	Carbon Resistor 15K ERD-25T J
233,236		
R134,234	0B01679A	Carbon Resistor 100 ERD-25T J
R135,138	0B05640A	Carbon Resistor 180K ERD-25T J
235,238		
R137,237	0B05675A	Carbon Resistor 3.9K ERD-25T J
R139,239	0B01854A	Carbon Resistor 39K ERD-25T J
R140,240	0B05691A	Carbon Resistor 390 ERD-25T J
R141,142	0B05615A	Carbon Resistor 22K ERD-25T J
241,242		
R143,243	0B05614A	Carbon Resistor 1.8K ERD-25T J
R144,244	0B01888A	Carbon Resistor 10K ERD-25T J
R145,245	0B05936A	Carbon Resistor 10 ERD-25T J

Schematic Ref. No.	Part No.	Description
R305,306	0B09213A	Fail Safe Type Resistor 150 RDF-25S J
R324	0B05776A	Carbon Resistor 1M ERD-25T J
C122,222	0B05583A	Mylar Capacitor 0.033μ 50V J
C123,223	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C124,224	0B05659A	Mylar Capacitor 5600P 50V J
C125,225	0B01412A	Electrolytic Capacitor 10μ 16V
C126,226	0B05685A	Mylar Capacitor 0.082μ 50V J
C127,227	0B01914A	Mylar Capacitor 3300P 50V J
C128,228	0B09247A	Mica Capacitor 220P 50V J
C129,229	0B09286A	Ceramic Capacitor 470P 50V K
C130,230	0B09322A	PP Capacitor 330P 100V J
C305,306	0B01502A	Electrolytic Capacitor 330μ 16V
		– Headphone Amp. –
IC305	0B06217A	IC RC4560D
Q109,209	0B06066A	Transistor 2SD471
Q110,210	0B06069A	Transistor 2SB564
R146,148	0B01889A	Carbon Resistor 100K ERD-25T J
246,248		
R147,247	0B01706A	Carbon Resistor 47 ERD-25T J
R149,249	0B09321A	Fail Safe Type Resistor 4.7 RDF-25S J
R328,329	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
C131,231	0B09291A	Ceramic Capacitor 0.022μ 50V Z
C317,318	0B01400A	Electrolytic Capacitor 100μ 16V
		– Line Amp. –
IC301	0B06146A	IC RC4558DD
Q103,203	0B01872A	Transistor 2SC945 (L)
L103,203	0B03919B	Inductor 36mH
R101,103	0B01857A	Carbon Resistor 1K ERD-25T J
201,203		
R102,104	0B05625A	Carbon Resistor 220K ERD-25T J
202,204		
R105,205	0B09582A	Metal Film Resistor 43.2K SN14K2E F
R106,206	0B09507A	Metal Film Resistor 3.57K SN14K2E F
R113,213	0B01888A	Carbon Resistor 10K ERD-25T J
R153,253	0B05622A	Carbon Resistor 2.2K ERD-25T J
C108,208	0B09409A	PP Capacitor 1800P 100V G
C109,209	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C110,210	0B09148A	Electrolytic Capacitor 10μ 25V (LN)
C303,304	0B01400A	Electrolytic Capacitor 100μ 16V
		– Meter Amp. –
IC303	0B06280A	IC MSM4066RS
IC304	0B06216A	IC μPC4556C
Q113,213	0B01872A	Transistor 2SC945 (L)
305		
ZD101,201	0B06058A	Zener Diode 5.1V YZ051
D104,105	0B06181A	Silicon Diode 1SS53
204,205		
303,308		
VR102,202	0B07233A	Semi-fixed Volume 10K
VR103,203	0B07387A	Semi-fixed Volume 220
R107,108	0B01888A	Carbon Resistor 10K ERD-25T J
158,207		
208,258		
307,308		
R153,154	0B01889A	Carbon Resistor 100K ERD-25T J
253,254		
309,311		

Schematic Ref. No.	Part No.	Description
R155,156	0B05615A	Carbon Resistor 22K ERD-25T J
255,256		
310		
R157,257	0B05890A	Carbon Resistor 56 ERD-25T J
R159,259	0B05625A	Carbon Resistor 220K ERD-25T J
R160,260	0B01857A	Carbon Resistor 1K ERD-25T J
R161,261	0B05620A	Carbon Resistor 270K ERD-25T J
R162,262	0B01856A	Carbon Resistor 8.2K ERD-25T J
R163,263	0B05622A	Carbon Resistor 2.2K ERD-25T J
R164,264	0B05627A	Carbon Resistor 330K ERD-25T J
R312,313	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
C133,135	0B01405A	Electrolytic Capacitor 1μ 50V
139,233		
235,239		
C134,136	0B09586A	Ceramic Capacitor 2200P 50V K
234,236		
C137,237	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C138,238	0B09147A	Electrolytic Capacitor 3.3μ 50V (LN)
C307,308	0B01502A	Electrolytic Capacitor 330μ 16V
		– Bias Osc. –
Q301,302	0B01872A	Transistor 2SC945 (L)
Q303	0B06202A	Transistor 2SA562 (Y)
Q304	0B06013A	Transistor 2SA733
T301	0B06613A	Osc. Coil
R314	0B05625A	Carbon Resistor 220K ERD-25T J
R315,316	0B09212A	Fail Safe Type Resistor 2.2 RDF-25S J
R317,318	0B05668A	Carbon Resistor 82K ERD-25T J
R319	0B09295A	Fail Safe Type Resistor 82 RSF-2B J
R320	0B09296A	Fail Safe Type Resistor 39 RSF-1/2B J
R321	0B01682A	Carbon Resistor 6.8K ERD-25T J
R322	0B05692A	Carbon Resistor 68K ERD-25T J
R323	0B05509A	Carbon Resistor 33K ERD-25T J
C310	0B09254A	PP Capacitor 0.068μ 100V J
C311	0B01402A	Electrolytic Capacitor 4.7μ 25V
C312,313	0B09191A	PP Capacitor 4700P 100V G
C314	0B09405A	PP Capacitor 0.022μ 100V J
	0J04417A	Osc. Coil Shield Plate (1 pce.)
		– Miscellaneous –
	0B07979C	Main P.C.B.
Q111,112	0B06070A	Transistor 2SC1636
211,212		
Q306,307	0B06013A	Transistor 2SA733
D304,305	0B06181A	Silicon Diode 1SS53
R109,110	0B05776A	Carbon Resistor 1M ERD-25T J
209,210		
R111,211	0B09492A	Metal Film Resistor 1.62K SN14K2E F
R112,212	0B09585A	Metal Film Resistor 2.1K SN14K2E F
R114,214	0B09314A	Carbon Resistor 5.1K ERD-25T J
R150,250	0B05691A	Carbon Resistor 390 ERD-25T J
R151,251	0B01888A	Carbon Resistor 10K ERD-25T J
332,333		
R152,252	0B01682A	Carbon Resistor 6.8K ERD-25T J
R165,265	0B01889A	Carbon Resistor 100K ERD-25T J
330,331		
R301,302	0B09214A	Fail Safe Type Resistor 1 RDF-25S J
R325,326	0B05620A	Carbon Resistor 270K ERD-25T J
R327	0B05692A	Carbon Resistor 68K ERD-25T J
R334,335	0B05509A	Carbon Resistor 33K ERD-25T J
R336	0B09603A	Fail Safe Type Resistor 0.2 ERX-12AN J

Schematic Ref. No.	Part No.	Description
C107,207	0B05583A	Mylar Capacitor 0.033μ 50V J
C132,232	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C140,240	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C301,302	0B01397A	Electrolytic Capacitor 1000μ 16V
C309	0B05681A	Mylar Capacitor 0.01μ 50V J
SW1	0B07385A	Record/Play Switch CL112K
CN1,2	0B08654A	4P-T Post
CN3	0B08656A	2P-T Post
CN14,16	0B08178A	12P-T Post
CN15	0B08506A	13P-T Post
	0J04398A	Record Spring (1 pce.)
	0B08569C	Record Wire Holder (1 pce.)
	0B08570C	Record Spring Holder (1 pce.)
	0B08897A	Shield Plate (1 pce.)

7.13. Main P.C.B. Ass'y

Note: Diode is 1SS53 unless otherwise specified.

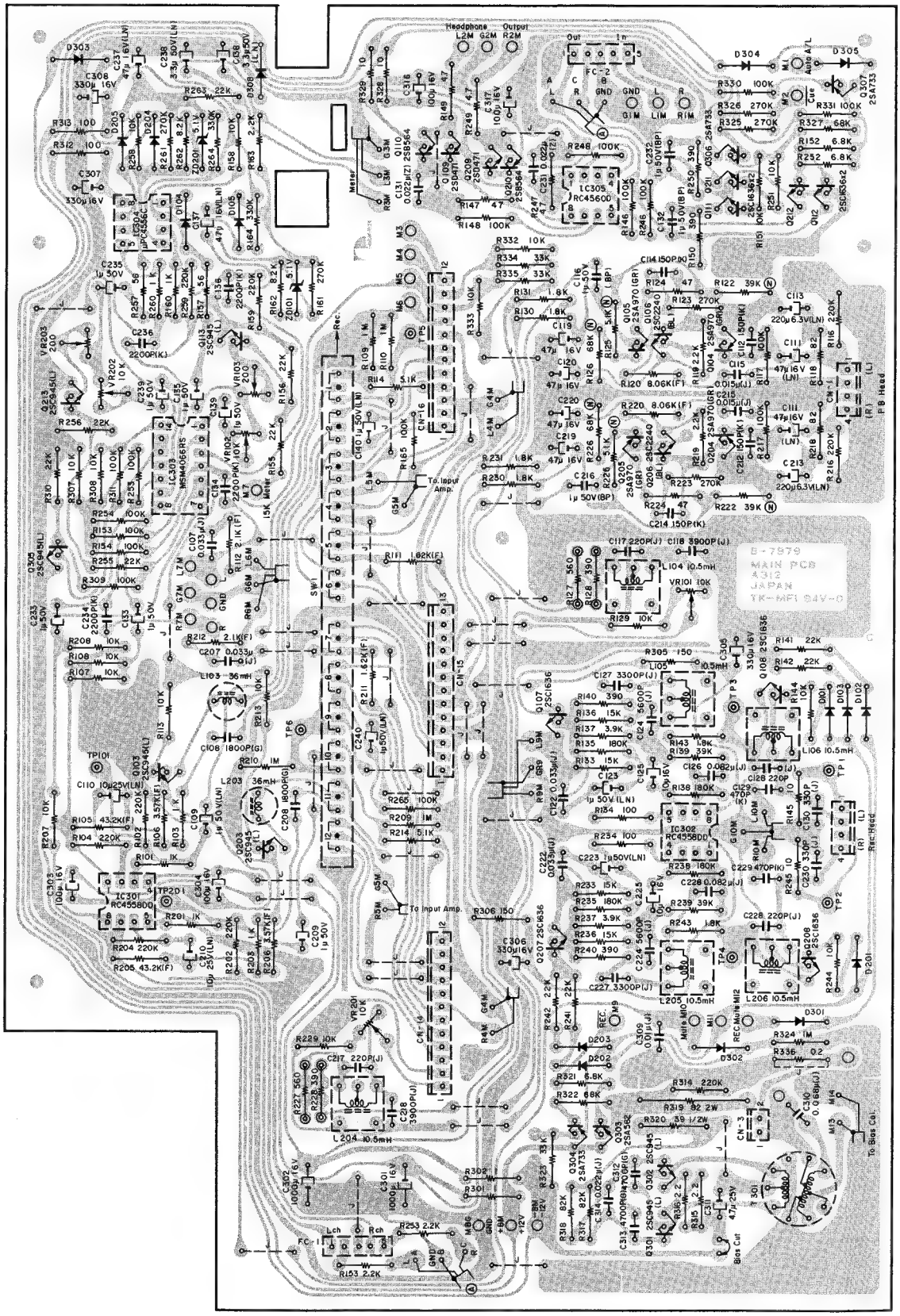


Fig. 7.13.1 Serial No.: A31201908 –

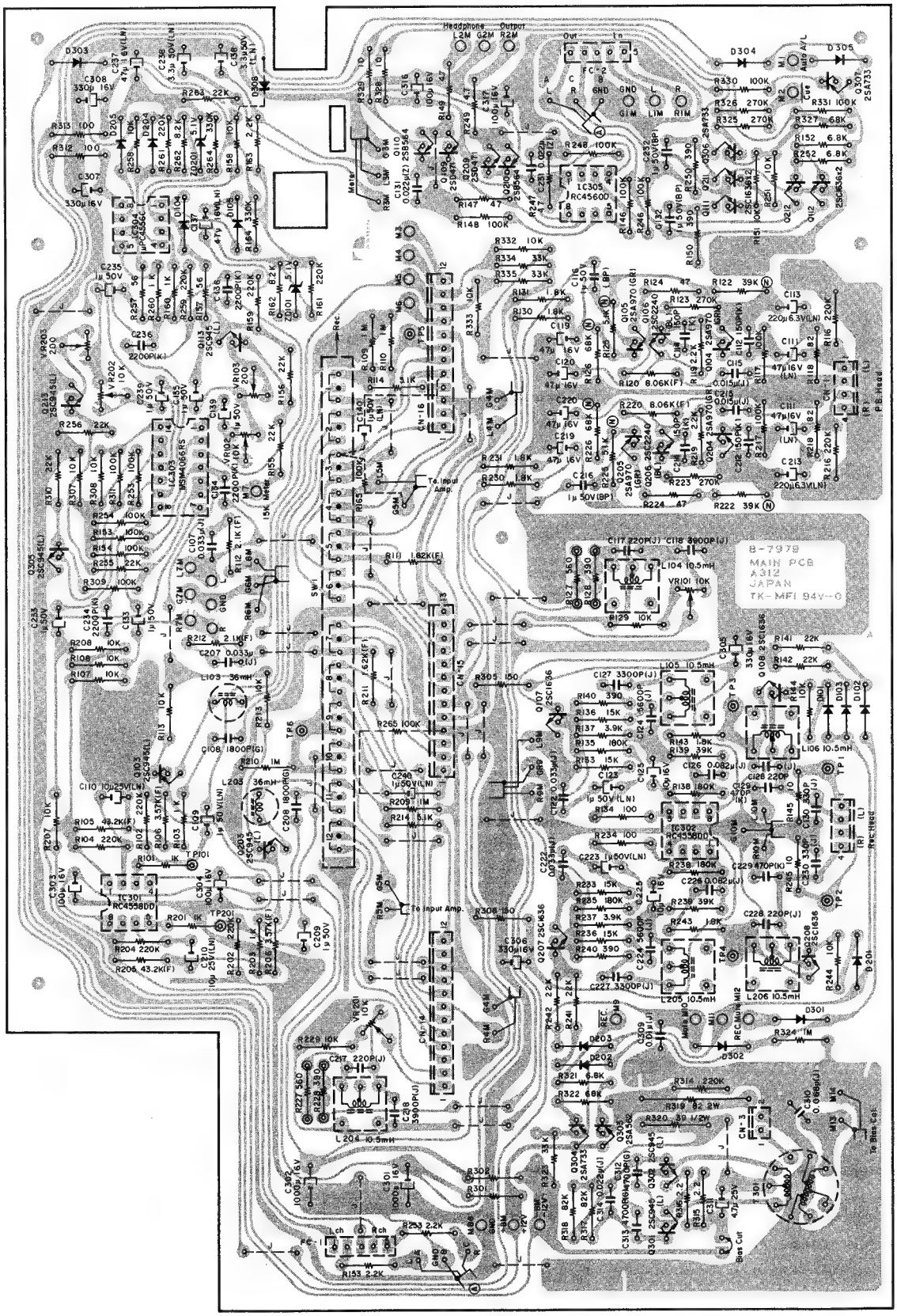


Fig. 7.13.2 Serial Nos.: A31201001 – A31201907

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04462A	**Main P.C.B. Ass'y**
		Serial Nos.: A31201001 – A31201907
		– PB Eq. Amp. –
Q104,105	0B06180A	Transistor 2SA970 (GR)
204,205		
Q106,206	0B06142A	Transistor 2SC2240 (BL)
L104,204	0B00068A	Trap Coil 10.5mH
VR101,201	0B07233A	Semi-fixed Volume 10K
R116,216	0B05625A	Carbon Resistor 220K ERD-25T J
R117,217	0B01889A	Carbon Resistor 100K ERD-25T J
R118,218	0B05631A	Carbon Resistor 82 ERD-25T J
R119,219	0B09309A	Carbon Resistor 2.2K ERD-25TS J (Noiseless)
R120,220	0B09431A	Metal Film Resistor 8.06K SN14K2E F
R122,222	0B09310A	Carbon Resistor 33K ERD-25TS J (Noiseless)
R123,223	0B05620A	Carbon Resistor 270K ERD-25T J
R124,224	0B01706A	Carbon Resistor 47 ERD-25T J
R125,225	0B09388A	Carbon Resistor 5.1K ERD-25TS J (Noiseless)
R126,226	0B09311A	Carbon Resistor 68K ERD-25TS J (Noiseless)
R127,227	0B05575A	Carbon Resistor 560 ERD-25T J
R128,228	0B05691A	Carbon Resistor 390 ERD-25T J
R129,229	0B01888A	Carbon Resistor 10K ERD-25T J
R130,131	0B05614A	Carbon Resistor 1.8K ERD-25T J
230,231		
C111,211	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C112,114	0B09281A	Ceramic Capacitor 150P 50V K
212,214		
C113,213	0B09151A	Electrolytic Capacitor 220μ 6.3V (LN)
C115,215	0B05557A	Mylar Capacitor 0.015μ 50V J
C116,216	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C117,217	0B09247A	Mica Capacitor 220P 50V J
C118,218	0B01804A	Mylar Capacitor 3900P 50V J
C119,120	0B01403A	Electrolytic Capacitor 47μ 16V
219,220		
		– Rec. Amp. –
IC302	0B06146A	IC RC4558DD
Q107,108	0B06070A	Transistor 2SC1636
207,208		
D101,102	0B06181A	Silicon Diode 1SS53
103,201		
202,203		
301,302		
L105,106	0B00068A	Trap Coil 10.5mH
205,206		
R133,136	0B01683A	Carbon Resistor 15K ERD-25T J
233,236		
R134,234	0B01679A	Carbon Resistor 100 ERD-25T J
R135,138	0B05640A	Carbon Resistor 180K ERD-25T J
235,238		
R137,237	0B05675A	Carbon Resistor 3.9K ERD-25T J
R139,239	0B01854A	Carbon Resistor 39K ERD-25T J
R140,240	0B05691A	Carbon Resistor 390 ERD-25T J
R141,142	0B05615A	Carbon Resistor 22K ERD-25T J
241,242		
R143,243	0B05614A	Carbon Resistor 1.8K ERD-25T J
R144,244	0B01888A	Carbon Resistor 10K ERD-25T J
R145,245	0B05936A	Carbon Resistor 10 ERD-25T J
R305,306	0B09213A	Fail Safe Type Resistor 150 RDF-25S J
R324	0B05776A	Carbon Resistor 1M ERD-25T J
C122,222	0B05583A	Mylar Capacitor 0.033μ 50V J
C123,223	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C124,224	0B05659A	Mylar Capacitor 5600P 50V J
C125,225	0B01412A	Electrolytic Capacitor 10μ 16V
C126,226	0B05685A	Mylar Capacitor 0.082μ 50V J
C127,227	0B01914A	Mylar Capacitor 3300P 50V J
C128,228	0B09247A	Mica Capacitor 220P 50V J
C129,229	0B09286A	Ceramic Capacitor 470P 50V K
C130,230	0B09322A	PP Capacitor 330P 100V J
C305,306	0B01502A	Electrolytic Capacitor 330μ 16V
		– Headphone Amp. –
IC305	0B06217A	IC RC4560D
Q109,209	0B06066A	Transistor 2SD471
Q110,210	0B06069A	Transistor 2SB564
R146,148	0B01889A	Carbon Resistor 100K ERD-25T J
246,248		
R147,247	0B01706A	Carbon Resistor 47 ERD-25T J
R149,249	0B09321A	Fail Safe Type Resistor 4.7 RDF-25S J
R328,329	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
C131,231	0B09291A	Ceramic Capacitor 0.022μ 50V Z
C317,318	0B01400A	Electrolytic Capacitor 100μ 16V
		– Line Amp. –
IC301	0B06146A	IC RC4558DD
Q103,203	0B01872A	Transistor 2SC945 (L)
L103,203	0B03919B	Inductor 36mH
R101,103	0B01857A	Carbon Resistor 1K ERD-25T J
201,203		
R102,104	0B05625A	Carbon Resistor 220K ERD-25T J
202,204		
R105,205	0B09582A	Metal Film Resistor 43.2K SN14K2E F
R106,206	0B09507A	Metal Film Resistor 3.57K SN14K2E F
R113,213	0B01888A	Carbon Resistor 10K ERD-25T J
R153,253	0B05622A	Carbon Resistor 2.2K ERD-25T J
C108,208	0B09409A	PP Capacitor 1800P 100V G
C109,209	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C110,210	0B09148A	Electrolytic Capacitor 10μ 25V (LN)
C303,304	0B01400A	Electrolytic Capacitor 100μ 16V
		– Meter Amp. –
IC303	0B06280A	IC MSM4066RS
IC304	0B06216A	IC μPC4556C
Q113,213	0B01872A	Transistor 2SC945 (L)
305		
ZD101,201	0B06058A	Zener Diode 5.1V YZ051
D104,105	0B06181A	Silicon Diode 1SS53
204,205		
303,308		
VR102,202	0B07233A	Semi-fixed Volume 10K
VR103,203	0B07387A	Semi-fixed Volume 220
R107,108	0B01888A	Carbon Resistor 10K ERD-25T J
158,207		
208,258		
307,308		
R153,154	0B01889A	Carbon Resistor 100K ERD-25T J
253,254		
309,311		
R155,156	0B05615A	Carbon Resistor 22K ERD-25T J
255,256		
310		
R157,257	0B05890A	Carbon Resistor 56 ERD-25T J
R159,161	0B05625A	Carbon Resistor 220K ERD-25T J
259,261		
R160,260	0B01857A	Carbon Resistor 1K ERD-25T J
R162,262	0B01856A	Carbon Resistor 8.2K ERD-25T J
R163,263	0B05622A	Carbon Resistor 2.2K ERD-25T J
R164,264	0B05627A	Carbon Resistor 330K ERD-25T J
R312,313	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
C133,135	0B01405A	Electrolytic Capacitor 1μ 50V
139,233		
235,239		
C134,136	0B09586A	Ceramic Capacitor 2200P 50V K
234,236		
C137,237	0B09218A	Electrolytic Capacitor 47μ 16V (LN)
C138,238	0B09147A	Electrolytic Capacitor 3.3μ 50V (LN)
C307,308	0B01502A	Electrolytic Capacitor 330μ 16V
		– Bias Osc. –
Q301,302	0B01872A	Transistor 2SC945 (L)
Q303	0B06202A	Transistor 2SA562 (Y)
Q304	0B06013A	Transistor 2SA733
T301	0B06613A	Osc. Coil
R314	0B05625A	Carbon Resistor 220K ERD-25T J
R315,316	0B09212A	Fail Safe Type Resistor 2.2 RDF-25S J
R317,318	0B05668A	Carbon Resistor 82K ERD-25T J
R319	0B09295A	Fail Safe Type Resistor 82 RSF-2B J
R320	0B09296A	Fail Safe Type Resistor 39 RSF-1/2B J
R321	0B01682A	Carbon Resistor 6.8K ERD-25T J
R322	0B05692A	Carbon Resistor 68K ERD-25T J
R323	0B05509A	Carbon Resistor 33K ERD-25T J
C310	0B09254A	PP Capacitor 0.068μ 100V J
C311	0B01402A	Electrolytic Capacitor 4.7μ 25V
C312,313	0B09191A	PP Capacitor 4700P 100V G
C314	0B09405A	PP Capacitor 0.022μ 100V J
	0J04417A	Osc. Coil Shield Plate (1 pce.)
		– Miscellaneous –
	0B07979A	Main P.C.B.
Q111,112	0B06070A	Transistor 2SC1636
211,212		
Q306,307	0B06013A	Transistor 2SA733
D304,305	0B06181A	Silicon Diode 1SS53
R109,110	0B05776A	Carbon Resistor 1M ERD-25T J
209,210		
R111,211	0B09492A	Metal Film Resistor 1.62K SN14K2E F
R112,212	0B09585A	Metal Film Resistor 2.1K SN14K2E F
R114,214	0B09314A	Carbon Resistor 5.1K ERD-25T J
R150,250	0B05691A	Carbon Resistor 390 ERD-25T J
R151,251	0B01888A	Carbon Resistor 10K ERD-25T J
332,333		
R152,252	0B01682A	Carbon Resistor 6.8K ERD-25T J
R165,265	0B01889A	Carbon Resistor 100K ERD-25T J
330,331		
R301,302	0B09214A	Fail Safe Type Resistor 1 RDF-25S J
R325,326	0B05620A	Carbon Resistor 270K ERD-25T J
R327	0B05692A	Carbon Resistor 68K ERD-25T J
R334,335	0B05509A	Carbon Resistor 33K ERD-25T J
C107,207	0B05583A	Mylar Capacitor 0.033μ 50V J
C132,232	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C140,240	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C301,302	0B01397A	Electrolytic Capacitor 1000μ 16V
C309	0B05681A	Mylar Capacitor 0.01μ 50V J
SW1	0B07385A	Record/Play Switch CL112K
CN1,2	0B08654A	4P-T Post
CN3	0B08656A	2P-T Post
CN14,16	0B08178A	12P-T Post
CN15	0B08506A	13P-T Post
	0J04398A	Record Spring (1 pce.)
	0B08569C	Record Wire Holder (1 pce.)
	0B08570C	Record Spring Holder (1 pce.)
	0B08897A	Shield Plate (1 pce.)

7.14. Dolby NR P.C.B. Ass'y

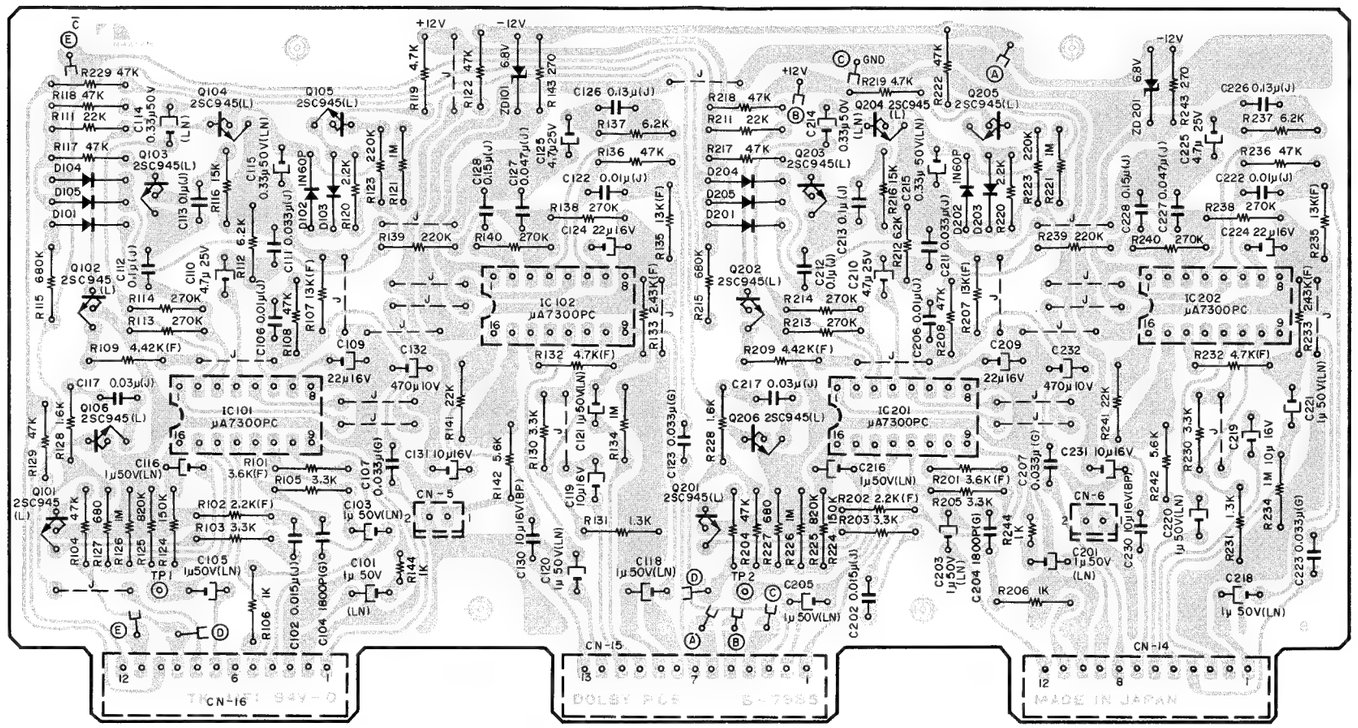


Fig. 7.14.1 Serial No.: A31201908 — Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04493A	**Dolby NR P.C.B. Ass'y** Serial No.: A31201908 —	208,217 218,222 229,236			R128,228 R131,231 R132,232	0B09565A 0B09074A 0B09356A	Carbon Resistor 1.6K ERD-25T J Carbon Resistor 1.3K ERD-25T J Metal Film Resistor 4.7K SN14K2E F	C114,115 214,215 C117,217	0B09567A 0B09594A	Electrolytic Capacitor 0.33μ 50V (LN) Mylar Capacitor 0.03μ 50V J
	0B07985B	Dolby NR P.C.B.	R106,206	0B01857A	Carbon Resistor 1K ERD-25T J	R133,233	0B09596A	Metal Film Resistor 2.43K SN14K2E F	C119,131 219,231	0B01412A	Electrolytic Capacitor 10μ 16V
IC101,102 201,202	0B06200A	IC μA7300PC	R107,135 207,235	0B09557A	Metal Film Resistor 13K SN14K2E F	R142,242 R143,243	0B01887A 0B05645A	Carbon Resistor 5.6K ERD-25T J Carbon Resistor 270 ERD-25T J	C126,226	0B09566A	Mylar Capacitor 0.13μ 50V J
Q101,102 103,104 105,106 201,202 203,204 205,206	0B01872A	Transistor 2SC945 (L)	R109,209 R111,141 211,241 R112,137 212,237 R113,114	0B09558A 0B05615A 0B09271A 0B05620A	Metal Film Resistor 4.42K SN14K2E F Carbon Resistor 22K ERD-25T J Carbon Resistor 6.2K ERD-25T J Carbon Resistor 270K ERD-25T J	R144,244 C101,103 105,116 118,120 121,201 203,205	0B01781A 0B09223A	Carbon Resistor 1K ERD-25V J Electrolytic Capacitor 1μ 50V (LN)	C127,227 C128,228 C130,230 C132,232 CN5,6 CN14,16	0B05796A 0B05914A 0B09163A 0B05884A 0B08656A 0B08732A	Mylar Capacitor 0.047μ 50V J Mylar Capacitor 0.15μ 50V J Electrolytic Capacitor 10μ 16V (BP) Electrolytic Capacitor 470μ 10V 2P-T Post 12P-S Connector
ZD101,201	0B06315A	Zener Diode 6.8V YZ068	138,140			216,218			CN15	0B08805A	13P-S Connector
D101,103 104,105 201,203 204,205	0B06181A	Silicon Diode 1SS53	213,214 238,240			220,221 C102,202	0B05557A	Mylar Capacitor 0.015μ 50V J		0B08714A	IC Socket 16P (4 pcs.)
D102,202	0B00030A	Germanium Diode 1N60P	R115,215 R116,216 R119,219	0B09335A 0B01683A 0B01846A	Carbon Resistor 680K ERD-25T J Carbon Resistor 15K ERD-25T J Carbon Resistor 4.7K ERD-25T J	C104,204 C106,122 206,222	0B09409A 0B05681A	PP Capacitor 1800P 100V G Mylar Capacitor 0.01μ 50V J			
R101,201	0B09568A	Metal Film Resistor 3.6K SN14K2E F	R120,220	0B05622A	Carbon Resistor 2.2K ERD-25T J	C107,123	0B09240A	PP Capacitor 0.033μ 100V G			
R102,202	0B09201A	Metal Film Resistor 2.2K SN14K2E F	R121,126	0B05776A	Carbon Resistor 1M ERD-25T J	207,223					
R103,105 130,203 205,230	0B01681A	Carbon Resistor 3.3K ERD-25T J	134,221 226,234 R123,139	0B05625A	Carbon Resistor 220K ERD-25T J	C109,124 209,224 C110,125	0B01862A 0B01402A	Electrolytic Capacitor 22μ 16V Electrolytic Capacitor 4.7μ 25V			
R104,108 117,118 122,129 136,204	0B05641A	Carbon Resistor 47K ERD-25T J	223,239 R124,224 R125,225 R127,227	0B05626A 0B09320A 0B05794A	Carbon Resistor 150K ERD-25T J Carbon Resistor 820K ERD-25T J Carbon Resistor 680 ERD-25T J	210,225 C111,211 C112,113 212,213	0B05583A 0B01780A	Mylar Capacitor 0.033μ 50V J Mylar Capacitor 0.1μ 50V J			

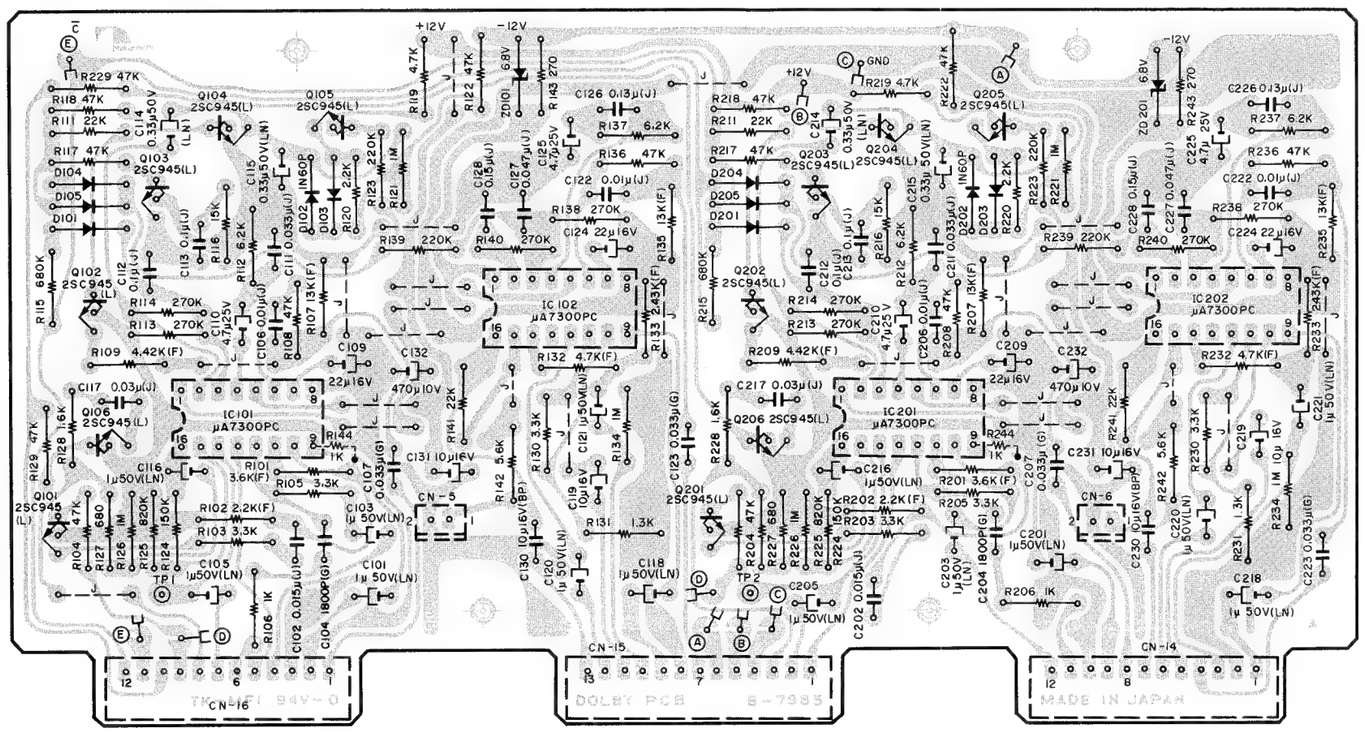
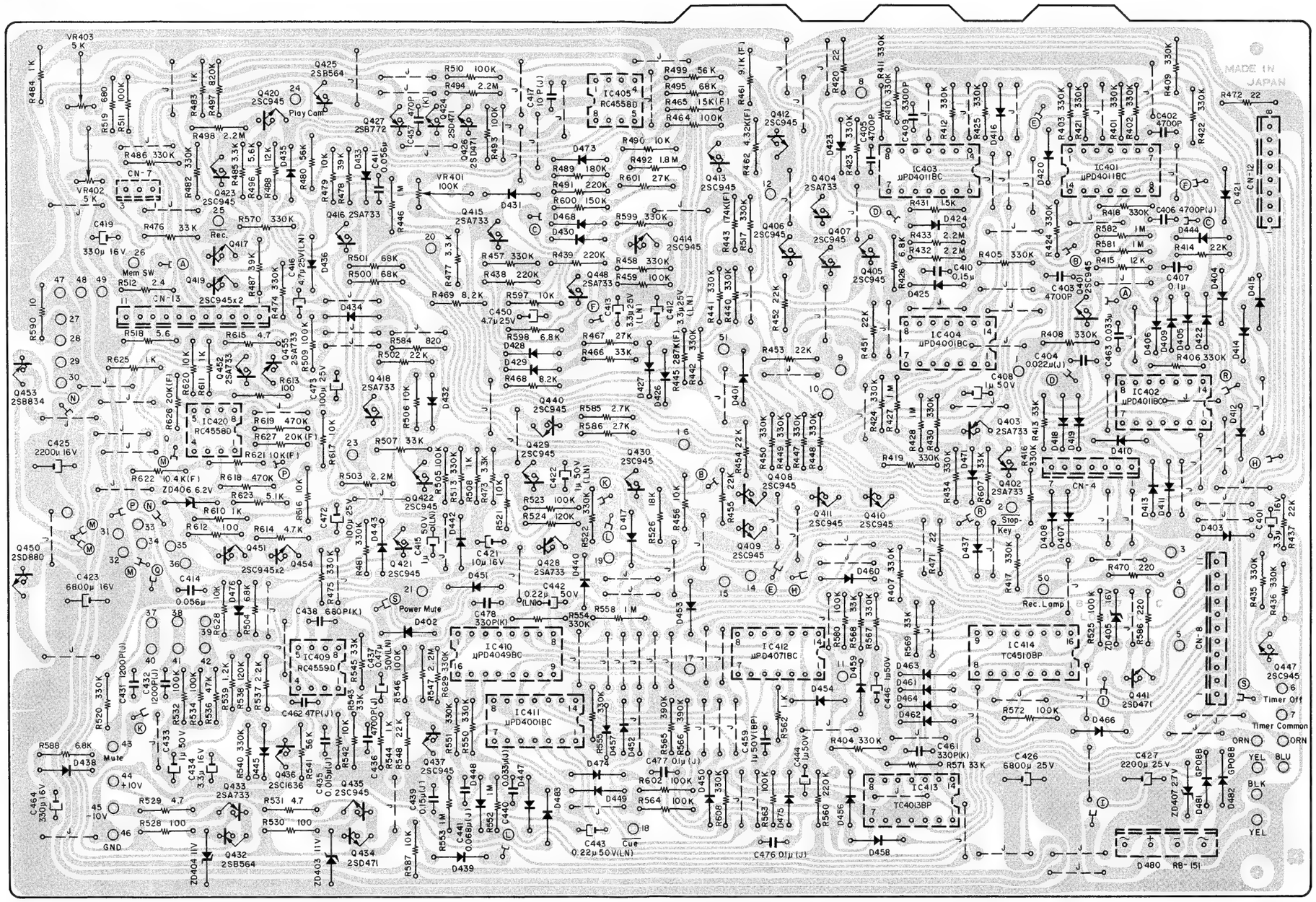


Fig. 7.14.2 Serial Nos.: A31201001 – A31201907 Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04493A	Dolby NR P.C.B. Ass'y	208,217			R128,228	0B09565A	Carbon Resistor 1.6K ERD-25T J	C114,115	0B09567A	Electrolytic Capacitor 0.33μ 50V (LN)
		Serial Nos.: A31201001 – A31201907	218,222			R131,231	0B09074A	Carbon Resistor 1.3K ERD-25T J	214,215		
			229,236			R132,232	0B09356A	Metal Film Resistor 4.7K SN14K2E F	C117,217	0B09594A	Mylar Capacitor 0.03μ 50V J
	0B07985A	Dolby NR P.C.B.	R106,206	0B01857A	Carbon Resistor 1K ERD-25T J	R133,233	0B09596A	Metal Film Resistor 2.43K SN14K2E F	C119,131	0B01412A	Electrolytic Capacitor 10μ 16V
IC101,102	0B06200A	IC μA7300PC	R107,135	0B09557A	Metal Film Resistor 13K SN14K2E F	R142,242	0B01887A	Carbon Resistor 5.6K ERD-25T J	219,231		
201,202			207,235			R143,243	0B05645A	Carbon Resistor 270 ERD-25T J	C126,226	0B09566A	Mylar Capacitor 0.13μ 50V J
Q101,102	0B01872A	Transistor 2SC945 (L)	R109,209	0B09558A	Metal Film Resistor 4.42K SN14K2E F	R144,244	0B01781A	Carbon Resistor 1K ERD-25V J	C127,227	0B05796A	Mylar Capacitor 0.047μ 50V J
103,104			R111,141	0B05615A	Carbon Resistor 22K ERD-25T J	C101,103	0B09223A	Electrolytic Capacitor 1μ 50V (LN)	C128,228	0B05914A	Mylar Capacitor 0.15μ 50V J
105,106			211,241			105,116			C130,230	0B09163A	Electrolytic Capacitor 10μ 16V (BP)
201,202			R112,137	0B09271A	Carbon Resistor 6.2K ERD-25T J	118,120			C132,232	0B05884A	Electrolytic Capacitor 470μ 10V
203,204			212,237			121,201			CN5,6	0B08656A	2P-T Post
205,206			R113,114	0B05620A	Carbon Resistor 270K ERD-25T J	203,205			CN14,16	0B08732A	12P-S Connector
ZD101,201	0B06315A	Zener Diode 6.8V YZ068	138,140			216,218			CN15	0B08805A	13P-S Connector
D101,103	0B06181A	Silicon Diode 1SS53	213,214			220,221				0B08714A	IC Socket 16P (4 pcs.)
104,105			238,240			C102,202	0B05557A	Mylar Capacitor 0.015μ 50V J			
201,203			R115,215	0B09335A	Carbon Resistor 680K ERD-25T J	C104,204	0B09409A	PP Capacitor 1800P 100V G			
204,205			R116,216	0B01683A	Carbon Resistor 15K ERD-25T J	C106,122	0B05681A	Mylar Capacitor 0.01μ 50V J			
D102,202	0B00030A	Germanium Diode 1N60P	R119,219	0B01846A	Carbon Resistor 4.7K ERD-25T J	206,222					
R101,201	0B09568A	Metal Film Resistor 3.6K SN14K2E F	R120,220	0B05622A	Carbon Resistor 2.2K ERD-25T J	C107,123	0B09240A	PP Capacitor 0.033μ 100V G			
R102,202	0B09201A	Metal Film Resistor 2.2K SN14K2E F	R121,126	0B05776A	Carbon Resistor 1M ERD-25T J	207,223					
R103,105	0B01681A	Carbon Resistor 3.3K ERD-25T J	134,221			C109,124	0B01862A	Electrolytic Capacitor 22μ 16V			
130,203			226,234			209,224					
205,230			R123,139	0B05625A	Carbon Resistor 220K ERD-25T J	C110,125	0B01402A	Electrolytic Capacitor 4.7μ 25V			
R104,108	0B05641A	Carbon Resistor 47K ERD-25T J	223,239			210,225					
117,118			R124,224	0B05626A	Carbon Resistor 150K ERD-25T J	C111,211	0B05583A	Mylar Capacitor 0.033μ 50V J			
122,129			R125,225	0B09320A	Carbon Resistor 820K ERD-25T J	C112,113	0B01780A	Mylar Capacitor 0.1μ 50V J			
136,204			R127,227	0B05794A	Carbon Resistor 680 ERD-25T J	212,213					

7.15. Logic P.C.B. Ass'y


MADE IN JAPAN
VR403 5K
VR402 5K
CN-7
CN-13
2SC945x2
Play Cam
Rec.
Mem SW
Power Mute
Mute
Stop Key
Rec. Lamp
Timer Off
Timer Common
IC420 RC4558D
IC409 RC4559D
IC410 μPD4049BC
IC411 μPD4001BC
IC404 μPD4001BC
IC405 RC4558D
IC403 μPD4011BC
IC401 μPD4011BC
IC402 μPD4011BC
IC412 μPD4071BC
IC414 TC4510BP
IC413 TC4013BP
Q425 2SB564
Q427 2SB772
Q453 2SB834
Q450 2SD880
Q432 2SB564
Q420 2SC945
Q423 2SC945
Q417
Q419
Q451
Q454
Q421 2SC945
Q422 2SC945
Q435 2SC945
Q437 2SC945
Q440 2SC945
Q429 2SC945
Q430 2SC945
Q428 2SA733
Q433 2SA733
Q434 2SD471
Q436 2SC1636
Q416 2SA733
Q418 2SA733
Q448 2SA733
Q452 2SA733
Q455 2SA733
Q414 2SC945
Q413 2SC945
Q412 2SC945
Q404 2SA733
Q407 2SC945
Q406 2SC945
Q405 2SC945
Q411 2SC945
Q410 2SC945
Q409 2SC945
Q403 2SA733
Q402 2SA733
Q441 2SD471
Q447 2SC945
Q415 2SA733
Q431 2SD471
Q426 2SD471
D473
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D471
D474
D475
D476
D480 RB-151
D481 GP08B
D482 GP08B
D483
ZD404 11V
ZD403 11V
ZD406 6.2V
ZD405
ZD407 27V
CN-12
CN-4
CN-8
R472 22
R484 1K
R590 10
R625 1K
R626 20K(F)
R622 10.4K(F)
R623 5.1K
R610 1K
R612 100
R614 4.7K
R616 10K
R498 2.2M
R486 330K
R485 3.3K
R496 5.6K
R488 12K
R435 56K
R480 56K
R479 10K
R478 39K
R433 0.056μ
R476 33K
R570 330K
R501 68K
R500 68K
R469 8.2K
R597 10K
R598 6.8K
R468 8.2K
R584 820
R502 22K
R506 10K
R507 33K
R503 2.2M
R505 100K
R513 330K
R508 1K
R473 3.3K
R521 10K
R523 100K
R524 120K
R526 18K
R456 10K
R455 22K
R454 22K
R450 330K
R449 330K
R447 330K
R448 330K
R585 2.7K
R586 2.7K
R596 10K
R467 27K
R466 33K
R445 287K(F)
R442 330K
R441 330K
R440 330K
R453 22K
R452 22K
R451 22K
R424 330K
R427 1M
R428 1M
R430 330K
R419
R434 330K
R607 33K
R437
R471 22
R407 330K
R417 330K
R435 330K
R436 330K
R470 220
R525 100K
R586 220
R572 100K
R404 330K
R560 220K
R563 100K
R564 100K
R602 100K
R565 390K
R566 390K
R567 330K
R568 330K
R580 100K
R569 33K
R571 33K
R562
R559 330K
R558 1M
R554 330K
R478 39K
R479 10K
R480 56K
R488 12K
R496 5.6K
R485 3.3K
R483 1K
R497 820K
R519 680
R511 100K
R510 100K
R494 2.2M
R493 100K
R492 1.8M
R490 10K
R489 180K
R491 220K
R600 150K
R599 330K
R458 330K
R459 100K
R439 220K
R438 220K
R457 330K
R477 3.3K
R601 27K
R462 4.32K(F)
R461 9.1K(F)
R499 56K
R495 68K
R465 15K(F)
R464 100K
R420 22
R411 330K
R410 330K
R412 330K
R425 330K
R403 330K
R421 330K
R401 330K
R402 330K
R409 330K
R422 330K
R431 15K
R432 2.2M
R433 2.2M
R426 6.8K
R405 330K
R582 1M
R581 1M
R415 12K
R418 330K
R424 330K
R408 330K
R427 1M
R428 1M
R430 330K
R419
R416 330K
R413 33K
R414 22K
R588 6.8K
R529 4.7
R528 100
R531 4.7
R530 100
R587 10K
R553 1M
R552 1M
R548 22K
R547 2.2M
R546 100K
R544 1K
R543 33K
R542 10K
R541 56K
R540 330K
R539 1.2K
R538 120K
R537 2.2K
R536 47K
R534 100K
R532 100K
R520 330K
R629 330K
R551 330K
R550 330K
R555 330K
R457 330K
R456 330K
R455 330K
R454 330K
R450 330K
R449 330K
R447 330K
R448 330K
R446 1M
R445 287K(F)
R442 330K
R441 330K
R440 330K
R453 22K
R452 22K
R451 22K
R424 330K
R427 1M
R428 1M
R430 330K
R419
R434 330K
R607 33K
R437
R471 22
R407 330K
R417 330K
R435 330K
R436 330K
R470 220
R525 100K
R586 220
R572 100K
R404 330K
R560 220K
R563 100K
R564 100K
R602 100K
R565 390K
R566 390K
R567 330K
R568 330K
R580 100K
R569 33K
R571 33K
R562
R559 330K
R558 1M
R554 330K
R478 39K
R479 10K
R480 56K
R488 12K
R496 5.6K
R485 3.3K
R483 1K
R497 820K
R519 680
R511 100K
R510 100K
R494 2.2M
R493 100K
R492 1.8M
R490 10K
R489 180K
R491 220K
R600 150K
R599 330K
R458 330K
R459 100K
R439 220K
R438 220K
R457 330K
R477 3.3K
R601 27K
R462 4.32K(F)
R461 9.1K(F)
R499 56K
R495 68K
R465 15K(F)
R464 100K
R420 22
R411 330K
R410 330K
R412 330K
R425 330K
R403 330K
R421 330K
R401 330K
R402 330K
R409 330K
R422 330K
R431 15K
R432 2.2M
R433 2.2M
R426 6.8K
R405 330K
R582 1M
R581 1M
R415 12K
R418 330K
R424 330K
R408 330K
R427 1M
R428 1M
R430 330K
R419
R416 330K
R413 33K
R414 22K
R588 6.8K
R529 4.7
R528 100
R531 4.7
R530 100
R587 10K
R553 1M
R552 1M
R548 22K
R547 2.2M
R546 100K
R544 1K
R543 33K
R542 10K
R541 56K
R540 330K
R539 1.2K
R538 120K
R537 2.2K
R536 47K
R534 100K
R532 100K
R520 330K
R629 330K
R551 330K
R550 330K
R555 330K
C419 330μ 16V
C425 2200μ 16V
C423 6800μ 16V
C464 330μ 16V
C414 0.056μ
C438 680P(K)
C462 47P(J)
C431 1200P(J)
C432 1200P(J)
C433 1μ 50V
C434 3.3μ 16V
C435 0.015μ(J)
C436 0.047μ 50V(LN)
C437 0.047μ 50V(LN)
C439 0.15μ(J)
C441 0.068μ(J)
C443 0.22μ 50V(LN)
C476 0.1μ (J)
C477 0.1μ (J)
C478 330P(K)
C450 4.7μ 25V
C473 100μ 25V
C472 100μ 25V
C415 1μ 50V(LN)
C421 10μ 16V
C422 1μ 50V(LN)
C442 0.22μ 50V(LN)
C417 10P(J)
C445 470P(K)
C424 250471
C411 0.056μ
C446 1μ 50V
C459 1μ 50V(BP)
C444 1μ 50V
C460 1μ 50V
C461 330P(K)
C426 6800μ 25V
C427 2200μ 25V
C428 0.22μ 50V(LN)
C440 0.033μ(J)
C412 3.3μ 25V (LN)
C413 3.3μ 25V (LN)
C405 4700P
C403 4700P
C406 4700P(J)
C402 4700P
C404 0.022μ(J)
C463 0.033μ
C408 50V
C410 0.15μ
C407 0.1μ
C401 3.3μ 16V
C422 16V
C409 16V
C447 16V
C448 16V
R622 10.4K(F)
R623 5.1K
R610 1K
R612 100
R614 4.7K
R616 10K
R498 2.2M
R486 330K
R485 3.3K
R496 5.6K
R488 12K
R435 56K
R480 56K
R479 10K
R478 39K
R476 33K
R570 330K
R501 68K
R500 68K
R469 8.2K
R597 10K
R598 6.8K
R468 8.2K
R584 820
R502 22K
R506 10K
R507 33K
R503 2.2M
R505 100K
R513 330K
R508 1K
R473 3.3K
R521 10K
R523 100K
R524 120K
R526 18K
R456 10K
R455 22K
R454 22K
R450 330K
R449 330K
R447 330K
R448 330K
R585 2.7K
R586 2.7K
R596 10K
R467 27K
R466 33K
R445 287K(F)
R442 330K
R441 330K
R440 330K
R453 22K
R452 22K
R451 22K
R424 330K
R427 1M
R428 1M
R430 330K
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R434 330K
R607 33K
R437
R471 22
R407 330K
R417 330K
R435 330K
R436 330K
R470 220
R525 100K
R586 220
R572 100K
R404 330K
R560 220K
R563 100K
R564 100K
R602 100K
R565 390K
R566 390K
R567 330K
R568 330K
R580 100K
R569 33K
R571 33K
R562
R559 330K
R558 1M
R554 330K
R478 39K
R479 10K
R480 56K
R488 12K
R496 5.6K
R485 3.3K
R483 1K
R497 820K
R519 680
R511 100K
R510 100K
R494 2.2M
R493 100K
R492 1.8M
R490 10K
R489 180K
R491 220K
R600 150K
R599 330K
R458 330K
R459 100K
R439 220K
R438 220K
R457 330K
R477 3.3K
R601 27K
R462 4.32K(F)
R461 9.1K(F)
R499 56K
R495 68K
R465 15K(F)
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R410 330K
R412 330K
R425 330K
R403 330K
R421 330K
R401 330K
R402 330K
R409 330K
R422 330K
R431 15K
R432 2.2M
R433 2.2M
R426 6.8K
R405 330K
R582 1M
R581 1M
R415 12K
R418 330K
R424 330K
R408 330K
R427 1M
R428 1M
R430 330K
R419
R416 330K
R413 33K
R414 22

Schematic Ref. No.	Part No.	Description
	BA04464A	**Logic P.C.B. Ass'y**
		Serial No.: A31202298 –
	– Logic –	
IC401,402	0B06178A	IC μPD4011BC
403		
IC404	0B06143A	IC μPD4001BC
IC405	0B06124B	IC RC4558D
Q401,405	0B06100A	Transistor 2SC945 (A)
406,407		
408,409		
410,411		
412,413		
414,417		
419,420		
421,422		
423,429		
430,440		
447		
Q402,403	0B06013A	Transistor 2SA733
404,415		
416,418		
428,448		
Q424,426	0B06066A	Transistor 2SD471
Q425	0B06069A	Transistor 2SB564
Q427	0B06303A	Transistor 2SB772
D401-440	0B01909A	Silicon Diode 1S1555 (47 pcs.)
442,443		
444,468		
471,473		
476		
VR401	0B03832A	Semi-fixed Volume 100K
VR402,403	0B03831A	Semi-fixed Volume 5K
R401,402	0B05627A	Carbon Resistor 330K ERD-25T J
403,404		
405,406		
407,408		
409,410		
411,412		
416,417		
418,419		
421,422		
423,424		
425,429		
430,434		
435,436		
440,441		
442,447		
448,449		
450,457		
458,474		
475,481		
482,486		
513,517		
520,522		
570,599		
R413,466	0B05509A	Carbon Resistor 33K ERD-25T J
476,507		
607		
R414,437	0B05615A	Carbon Resistor 22K ERD-25T J
451,452		
453,454		
455,502		

Schematic Ref. No.	Part No.	Description
R415,488	0B09263A	Carbon Resistor 12K ERD-25T J
R420,471	0B09049A	Fail Safe Type Resistor 22 RDF-25S J
472		
R426,504	0B01682A	Carbon Resistor 6.8K ERD-25T J
588,598		
R427,428	0B05776A	Carbon Resistor 1M ERD-25T J
446,581		
582		
R431	0B05698A	Carbon Resistor 1.5K ERD-25T J
R432,433	0B05671A	Carbon Resistor 2.2M ERD-25T J
494,498		
503		
R438,439	0B05625A	Carbon Resistor 220K ERD-25T J
491		
R443	0B09367A	Metal Film Resistor 174K SN14K2E F
R445	0B09366A	Metal Film Resistor 287K SN14K2E F
R456,479	0B01888A	Carbon Resistor 10K ERD-25T J
490,506		
521,587		
597,628		
R459,464	0B01889A	Carbon Resistor 100K ERD-25T J
493,505		
509,510		
511,523		
525,580		
R461	0B09328A	Metal Film Resistor 9.1K SN14K2E F
R462	0B09365A	Metal Film Resistor 4.32K SN14K2E F
R465	0B09340A	Metal Film Resistor 15K SN14K2E F
R467,601	0B05743A	Carbon Resistor 27K ERD-25T J
R468,469	0B01856A	Carbon Resistor 8.2K ERD-25T J
R470	0B01933A	Carbon Resistor 220 ERD-25T J
R473,477	0B01681A	Carbon Resistor 3.3K ERD-25T J
485		
R478,487	0B01854A	Carbon Resistor 39K ERD-25T J
R480,499	0B05508A	Carbon Resistor 56K ERD-25T J
R483,484	0B01857A	Carbon Resistor 1K ERD-25T J
508		
R489	0B05640A	Carbon Resistor 180K ERD-25T J
R492	0B05680A	Carbon Resistor 1.8M ERD-25T J
R495,500	0B05692A	Carbon Resistor 68K ERD-25T J
501		
R496	0B01887A	Carbon Resistor 5.6K ERD-25T J
R497	0B09320A	Carbon Resistor 820K ERD-25T J
R512	0B09580A	Fail Safe Type Resistor 2.4 RDF-25S J
R518	0B09217A	Fail Safe Type Resistor 5.6 RDF-25S J
R519	0B05794A	Carbon Resistor 680 ERD-25T J
R524	0B05621A	Carbon Resistor 120K ERD-25T J
R526	0B05560A	Carbon Resistor 18K ERD-25T J
R584	0B01680A	Carbon Resistor 820 ERD-25T J
R585,586	0B05629A	Carbon Resistor 2.7K ERD-25T J
R590	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R600	0B05626A	Carbon Resistor 150K ERD-25T J
C401	0B01863A	Electrolytic Capacitor 3.3μ 16V
C402,403	0B05556A	Mylar Capacitor 4700P 50V
405,406		
C404	0B05582A	Mylar Capacitor 0.022μ 50V J
C407	0B00093A	Mylar Capacitor 0.1μ 50V
C408	0B01405A	Electrolytic Capacitor 1μ 50V
C409	0B09166A	Mylar Capacitor 3300P 50V
C410	0B00610A	Mylar Capacitor 0.15μ 50V
C411,414	0B01676A	Mylar Capacitor 0.056μ 50V
C412,413	0B09147A	Electrolytic Capacitor 3.3μ 25V (LN)
C415,422	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C416	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)

Schematic Ref. No.	Part No.	Description
C417	0B09277A	Ceramic Capacitor 10P 50V J
C419,464	0B01502A	Electrolytic Capacitor 330μ 16V
C421	0B01412A	Electrolytic Capacitor 10μ 16V
C450	0B01402A	Electrolytic Capacitor 4.7μ 25V
C457	0B09286A	Ceramic Capacitor 470P 50V K
C463	0B05513A	Mylar Capacitor 0.033μ 50V
CN4	0B08643A	7P-T Post
CN7	0B08653A	3P-T Post
CN8,13	0B08655A	11P-T Post
CN12	0B08644A	8P-T Post
	– RAMM –	
IC409	0B06127A	IC RC4559D
IC410	0B06250A	IC μPD4049BC
IC411	0B06143A	IC μPD4001BC
IC412	0B06214A	IC μPD4071BC
IC413	0B06213A	IC TC4013BP
IC414	0B06212A	IC TC4510BP
Q436	0B06070A	Transistor 2SC1636
Q437	0B06100A	Transistor 2SC945 (A)
D445	0B06181A	Silicon Diode 1SS53 (22 pcs.)
447-454		
456-464		
466,474		
475,483		
R532,534	0B01889A	Carbon Resistor 100K ERD-25T J
546,563		
564,572		
602		
R536	0B05641A	Carbon Resistor 47K ERD-25T J
R537	0B05622A	Carbon Resistor 2.2K ERD-25T J
R538	0B05621A	Carbon Resistor 120K ERD-25T J
R539	0B05623A	Carbon Resistor 1.2K ERD-25T J
R540,550	0B05627A	Carbon Resistor 330K ERD-25T J
551,554		
555,567		
608,629		
R541	0B05508A	Carbon Resistor 56K ERD-25T J
R542	0B01888A	Carbon Resistor 10K ERD-25T J
R543,545	0B05509A	Carbon Resistor 33K ERD-25T J
568,569		
571		
R544,562	0B01857A	Carbon Resistor 1K ERD-25T J
R547	0B05671A	Carbon Resistor 2.2M ERD-25T J
R548	0B05615A	Carbon Resistor 22K ERD-25T J
R552,553	0B05776A	Carbon Resistor 1M ERD-25T J
558		
R560	0B05625A	Carbon Resistor 220K ERD-25T J
R565,566	0B05676A	Carbon Resistor 390K ERD-25T J
C431,432	0B05687A	Mylar Capacitor 1200P 50V J
C433,444	0B01405A	Electrolytic Capacitor 1μ 50V
446		
C434	0B01863A	Electrolytic Capacitor 3.3μ 16V
C435	0B05557A	Mylar Capacitor 0.015μ 50V J
C436	0B05652A	Mylar Capacitor 4700P 50V J
C437	0B09222A	Electrolytic Capacitor 0.47μ 50V (LN)
C438	0B09287A	Ceramic Capacitor 680P 50V K
C439	0B00610A	Mylar Capacitor 0.15μ 50V
C440	0B05583A	Mylar Capacitor 0.033μ 50V J
C441	0B05682A	Mylar Capacitor 0.068μ 50V J
C442,443	0B09144A	Electrolytic Capacitor 0.22μ 50V (LN)
C459	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C461,478	0B01180A	Ceramic Capacitor 330P 50V K

Schematic Ref. No.	Part No.	Description
C462	0B09280A	Ceramic Capacitor 47P 50V J
C476,477	0B05681A	Mylar Capacitor 0.01μ 50V J
	– Power Supply –	
IC420	0B06124B	IC RC4558D
Q432	0B06069A	Transistor 2SB564
Q433,452	0B06013A	Transistor 2SA733
455		
Q434,441	0B06066A	Transistor 2SD471
Q435,451	0B06100A	Transistor 2SC945 (A)
454		
Q450	0B06255A	Transistor 2SD880 (Y)
Q453	0B06256A	Transistor 2SB834 (Y)
ZD403,404	0B06231A	Zener Diode 11V RD11EB2
ZD405	0B06154A	Zener Diode 16V RD16EB3
ZD406	0B06167A	Zener Diode 6.2V RD6.2EB3
ZD407	0B06191A	Zener Diode 2.7V 2.7EB
D480	0B06183A	Diode Bridge RB151
D481,482	0B06109A	Silicon Diode GP08B
R528,530	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R529,531	0B09321A	Fail Safe Type Resistor 4.7 RDF-25S J
R586	0B05930A	Fail Safe Type Resistor 220 RDF-25S J
R610,611	0B01857A	Carbon Resistor 1K ERD-25T J
625		
R612,613	0B01679A	Carbon Resistor 100 ERD-25T J
R614,615	0B01846A	Carbon Resistor 4.7K ERD-25T J
R616,617	0B01888A	Carbon Resistor 10K ERD-25T J
620		
R618,619	0B01684A	Carbon Resistor 470K ERD-25T J
R621	0B09203A	Metal Film Resistor 10K SN14K2E F
R622	0B09433A	Metal Film Resistor 10.4K SN14K2E F
R623	0B09314A	Carbon Resistor 5.1K ERD-25T J
R626,627	0B09439A	Metal Film Resistor 20K SN14K2E F
C423	0B09398A	Electrolytic Capacitor 6800μ 16V
C425	0B01406A	Electrolytic Capacitor 2200μ 16V
C426	0B09374A	Electrolytic Capacitor 6800μ 25V
C427	0B05654A	Electrolytic Capacitor 2200μ 25V
C472,473	0B01272A	Electrolytic Capacitor 100μ 25V
	– Miscellaneous –	
	0B07987C	Logic P.C.B.
	0E00860A	BT Screw M3x6 Philips Binding Head (2 pcs.)
	0E00896A	Screw M3x6 Philips Binding Head (Chromate) (2 pcs.)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0J04408B	Heat Sink C (1 pce.)

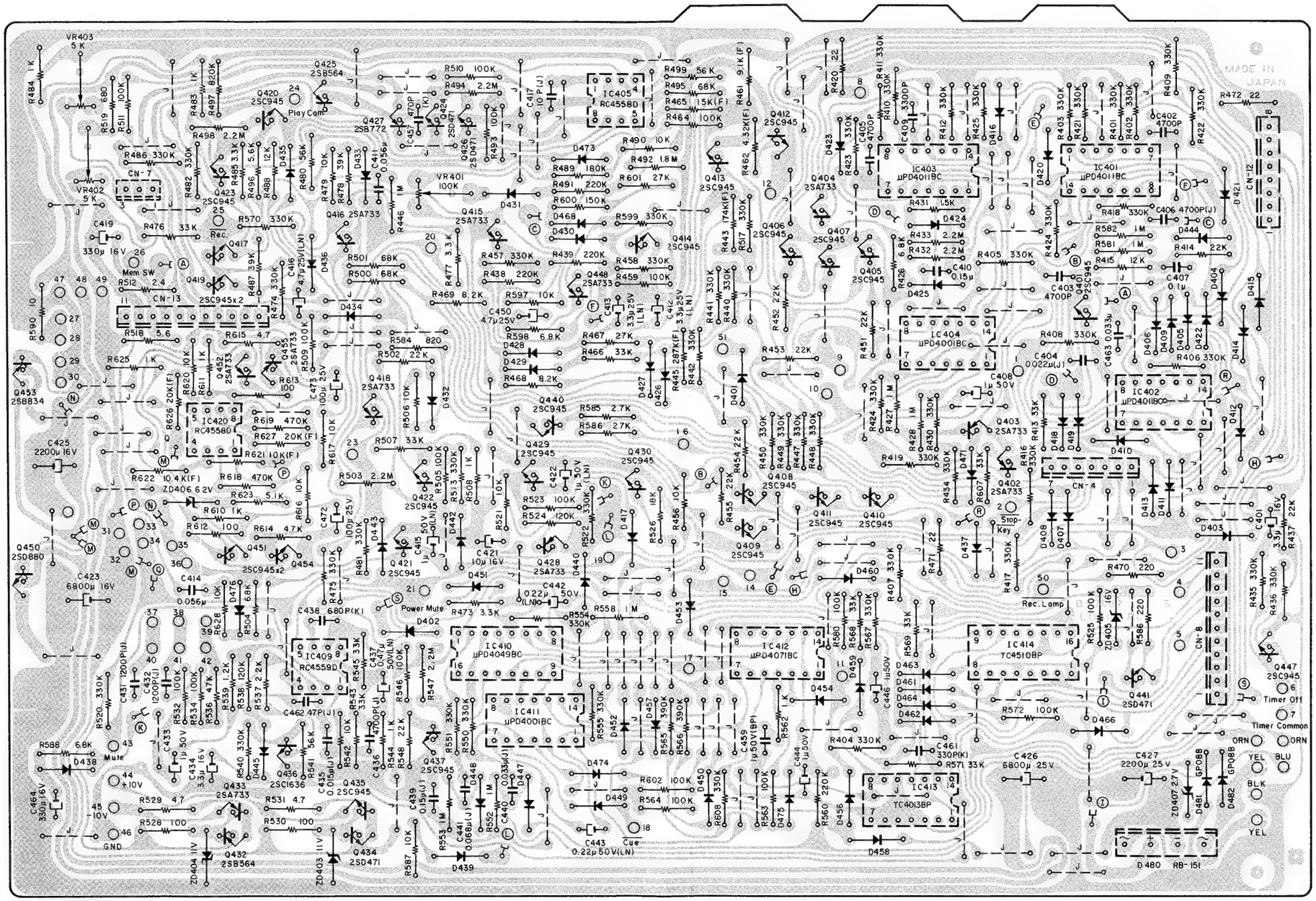


Fig. 7.15.2 Serial Nos.: A31201908 – A31202297

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04464A	**Logic P.C.B. Ass'y**
		Serial Nos.: A31201908 – A31202297
	– Logic –	
IC401,402	0B06178A	IC μPD4011BC
403		
IC404	0B06143A	IC μPD4001BC
IC405	0B06124B	IC RC4558D
Q401,405	0B06100A	Transistor 2SC945 (A)
406,407		
408,409		
410,411		
412,413		
414,417		
419,420		
421,422		
423,429		
430,440		
447		
Q402,403	0B06013A	Transistor 2SA733
404,415		
416,418		
428,448		
Q424,426	0B06066A	Transistor 2SD471
Q425	0B06069A	Transistor 2SB564
Q427	0B06303A	Transistor 2SB772
D401-440	0B01909A	Silicon Diode 1S1555 (47 pcs.)
442,443		
444,468		
471,473		
476		
VR401	0B03832A	Semi-fixed Volume 100K
VR402,403	0B03831A	Semi-fixed Volume 5K
R401,402	0B05627A	Carbon Resistor 330K ERD-25T J
403,404		
405,406		
407,408		
409,410		
411,412		
416,417		
418,419		
421,422		
423,424		
425,429		
430,434		
435,436		
440,441		
442,447		
448,449		
450,457		
458,474		
475,481		
482,486		
513,517		
520,522		
570,599		
R413,466	0B05509A	Carbon Resistor 33K ERD-25T J
476,507		
607		
R414,437	0B05615A	Carbon Resistor 22K ERD-25T J
451,452		
453,454		
455,502		

Schematic Ref. No.	Part No.	Description
R415,488	0B09263A	Carbon Resistor 12K ERD-25T J
R420,471	0B09049A	Fail Safe Type Resistor 22 RDF-25S J
472		
R426,504	0B01682A	Carbon Resistor 6.8K ERD-25T J
588,598		
R427,428	0B05776A	Carbon Resistor 1M ERD-25T J
446,581		
582		
R431	0B05698A	Carbon Resistor 1.5K ERD-25T J
R432,433	0B05671A	Carbon Resistor 2.2M ERD-25T J
494,498		
503		
R438,439	0B05625A	Carbon Resistor 220K ERD-25T J
491		
R443	0B09367A	Metal Film Resistor 174K SN14K2E F
R445	0B09366A	Metal Film Resistor 287K SN14K2E F
R456,479	0B01888A	Carbon Resistor 10K ERD-25T J
490,506		
521,587		
597,628		
R459,464	0B01889A	Carbon Resistor 100K ERD-25T J
493,505		
509,510		
511,523		
525,580		
R461	0B09328A	Metal Film Resistor 9.1K SN14K2E F
R462	0B09365A	Metal Film Resistor 4.32K SN14K2E F
R465	0B09340A	Metal Film Resistor 15K SN14K2E F
R467,601	0B05743A	Carbon Resistor 27K ERD-25T J
R468,469	0B01856A	Carbon Resistor 8.2K ERD-25T J
R470	0B01933A	Carbon Resistor 220 ERD-25T J
R473,477	0B01681A	Carbon Resistor 3.3K ERD-25T J
485		
R478,487	0B01854A	Carbon Resistor 39K ERD-25T J
R480,499	0B05508A	Carbon Resistor 56K ERD-25T J
R483,484	0B01857A	Carbon Resistor 1K ERD-25T J
508		
R489	0B05640A	Carbon Resistor 180K ERD-25T J
R492	0B05680A	Carbon Resistor 1.8M ERD-25T J
R495,500	0B05692A	Carbon Resistor 68K ERD-25T J
501		
R496	0B01887A	Carbon Resistor 5.6K ERD-25T J
R497	0B09320A	Carbon Resistor 820K ERD-25T J
R512	0B09580A	Fail Safe Type Resistor 2.4 RDF-25S J
R518	0B09217A	Fail Safe Type Resistor 5.6 RDF-25S J
R519	0B05794A	Carbon Resistor 680 ERD-25T J
R524	0B05621A	Carbon Resistor 120K ERD-25T J
R526	0B05560A	Carbon Resistor 18K ERD-25T J
R584	0B01680A	Carbon Resistor 820 ERD-25T J
R585,586	0B05629A	Carbon Resistor 2.7K ERD-25T J
R590	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R600	0B05626A	Carbon Resistor 150K ERD-25T J
C401	0B01863A	Electrolytic Capacitor 3.3μ 16V
C402,403	0B05556A	Mylar Capacitor 4700P 50V
405,406		
C404	0B05582A	Mylar Capacitor 0.022μ 50V J
C407	0B00093A	Mylar Capacitor 0.1μ 50V
C408	0B01405A	Electrolytic Capacitor 1μ 50V
C409	0B09166A	Mylar Capacitor 3300P 50V
C410	0B00610A	Mylar Capacitor 0.15μ 50V
C411,414	0B01676A	Mylar Capacitor 0.056μ 50V
C412,413	0B09147A	Electrolytic Capacitor 3.3μ 25V (LN)
C415,422	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C416	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)

Schematic Ref. No.	Part No.	Description
C417	0B09277A	Ceramic Capacitor 10P 50V J
C419,464	0B01502A	Electrolytic Capacitor 330μ 16V
C421	0B01412A	Electrolytic Capacitor 10μ 16V
C450	0B01402A	Electrolytic Capacitor 4.7μ 25V
C457	0B09286A	Ceramic Capacitor 470P 50V K
C463	0B05513A	Mylar Capacitor 0.033μ 50V
CN4	0B08643A	7P-T Post
CN7	0B08653A	3P-T Post
CN8,13	0B08655A	11P-T Post
CN12	0B08644A	8P-T Post
	– RAMM –	
IC409	0B06127A	IC RC4559D
IC410	0B06250A	IC μPD4049BC
IC411	0B06143A	IC μPD4001BC
IC412	0B06214A	IC μPD4071BC
IC413	0B06213A	IC TC4013BP
IC414	0B06212A	IC TC4510BP
Q436	0B06070A	Transistor 2SC1636
Q437	0B06100A	Transistor 2SC945 (A)
D445	0B06181A	Silicon Diode 1SS53 (21 pcs.)
447-454		
456-464		
466,474		
475		
R532,534	0B01889A	Carbon Resistor 100K ERD-25T J
546,563		
564,572		
602		
R536	0B05641A	Carbon Resistor 47K ERD-25T J
R537	0B05622A	Carbon Resistor 2.2K ERD-25T J
R538	0B05621A	Carbon Resistor 120K ERD-25T J
R539	0B05623A	Carbon Resistor 1.2K ERD-25T J
R540,550	0B05627A	Carbon Resistor 330K ERD-25T J
551,554		
555,567		
608		
R541	0B05508A	Carbon Resistor 56K ERD-25T J
R542	0B01888A	Carbon Resistor 10K ERD-25T J
R543,545	0B05509A	Carbon Resistor 33K ERD-25T J
568,569		
571		
R544,562	0B01857A	Carbon Resistor 1K ERD-25T J
R547	0B05671A	Carbon Resistor 2.2M ERD-25T J
R548	0B05615A	Carbon Resistor 22K ERD-25T J
R552,553	0B05776A	Carbon Resistor 1M ERD-25T J
558		
R560	0B05625A	Carbon Resistor 220K ERD-25T J
R565,566	0B05676A	Carbon Resistor 390K ERD-25T J
C431,432	0B05687A	Mylar Capacitor 1200P 50V J
C433,444	0B01405A	Electrolytic Capacitor 1μ 50V
446		
C434	0B01863A	Electrolytic Capacitor 3.3μ 16V
C435	0B05557A	Mylar Capacitor 0.015μ 50V J
C436	0B05652A	Mylar Capacitor 4700P 50V J
C437	0B09222A	Electrolytic Capacitor 0.47μ 50V (LN)
C438	0B09287A	Ceramic Capacitor 680P 50V K
C439	0B00610A	Mylar Capacitor 0.15μ 50V
C440	0B05583A	Mylar Capacitor 0.033μ 50V J
C441	0B05682A	Mylar Capacitor 0.068μ 50V J
C442,443	0B09144A	Electrolytic Capacitor 0.22μ 50V (LN)
C459	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C461	0B01180A	Ceramic Capacitor 330P 50V K

Schematic Ref. No.	Part No.	Description
C462	0B09280A	Ceramic Capacitor 47P 50V J
	– Power Supply –	
IC420	0B06124B	IC RC4558D
Q432	0B06069A	Transistor 2SB564
Q433,452	0B06013A	Transistor 2SA733
455		
Q434,441	0B06066A	Transistor 2SD471
Q435,451	0B06100A	Transistor 2SC945 (A)
454		
Q450	0B06255A	Transistor 2SD880 (Y)
Q453	0B06256A	Transistor 2SB834 (Y)
ZD403,404	0B06231A	Zener Diode 11V RD11EB2
ZD405	0B06154A	Zener Diode 16V RD16EB3
ZD406	0B06167A	Zener Diode 6.2V RD6.2EB3
ZD407	0B06191A	Zener Diode 2.7V 2.7EB
D480	0B06183A	Diode Bridge RB151
D481,482	0B06109A	Silicon Diode GP08B
R528,530	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R529,531	0B09321A	Fail Safe Type Resistor 4.7 RDF-25S J
R586	0B05930A	Fail Safe Type Resistor 220 RDF-25S J
R610,611	0B01857A	Carbon Resistor 1K ERD-25T J
625		
R612,613	0B01679A	Carbon Resistor 100 ERD-25T J
R614,615	0B01846A	Carbon Resistor 4.7K ERD-25T J
R616,617	0B01888A	Carbon Resistor 10K ERD-25T J
620		
R618,619	0B01684A	Carbon Resistor 470K ERD-25T J
R621	0B09203A	Metal Film Resistor 10K SN14K2E F
R622	0B09433A	Metal Film Resistor 10.4K SN14K2E F
R623	0B09314A	Carbon Resistor 5.1K ERD-25T J
R626,627	0B09439A	Metal Film Resistor 20K SN14K2E F
C423	0B09398A	Electrolytic Capacitor 6800μ 16V
C425	0B01406A	Electrolytic Capacitor 2200μ 16V
C426	0B09374A	Electrolytic Capacitor 6800μ 25V
C427	0B05654A	Electrolytic Capacitor 2200μ 25V
C472,473	0B01272A	Electrolytic Capacitor 100μ 25V
	– Miscellaneous –	
	0B07987B	Logic P.C.B.
	0E00860A	BT Screw M3x6 Philips Binding Head (2 pcs.)
	0E00896A	Screw M3x6 Philips Binding Head (Chromate) (2 pcs.)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0J04408B	Heat Sink C (1 pce.)

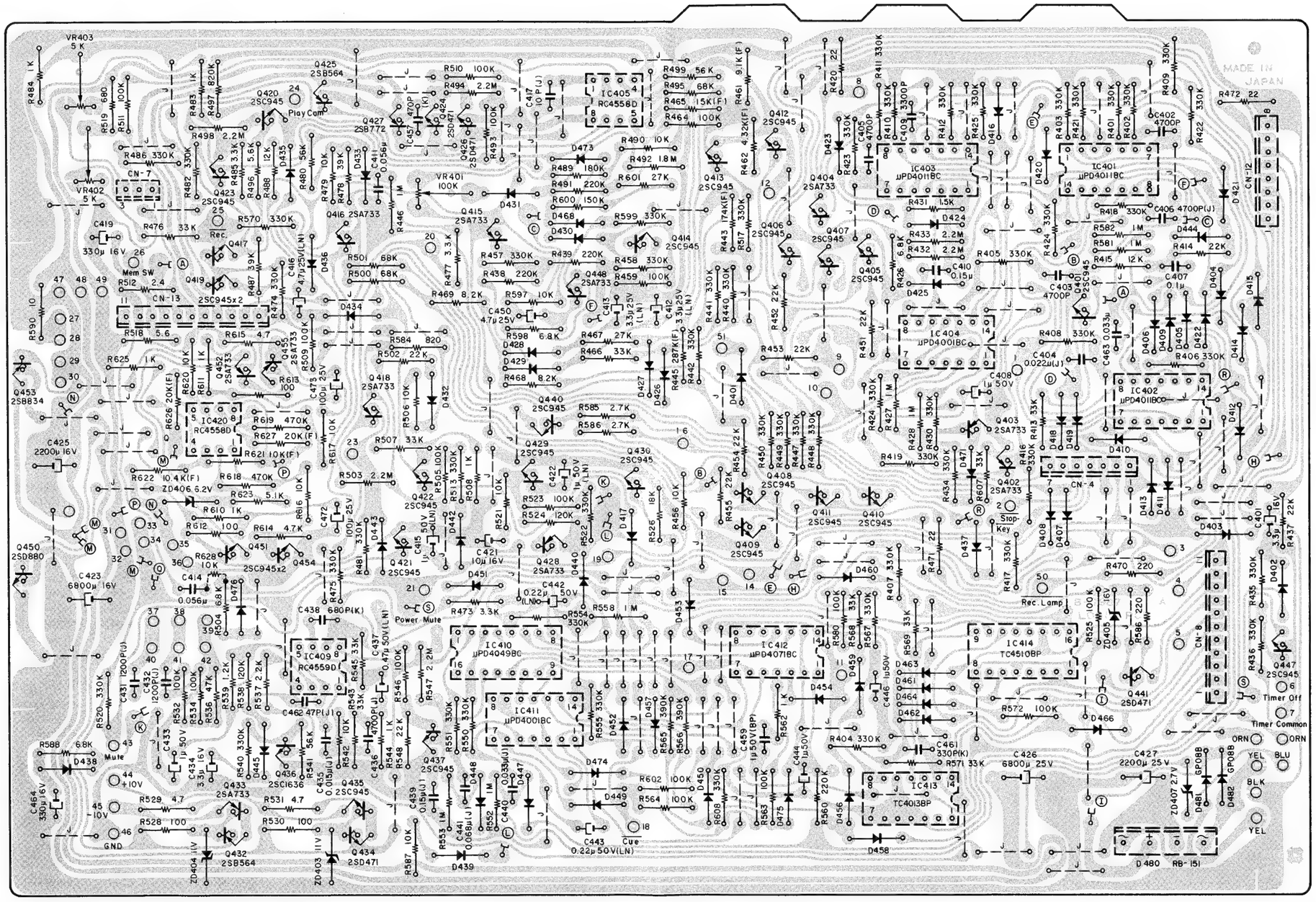


Fig. 7.15.3 Serial Nos.: A31201001 – A31201907

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description
	BA04464A	**Logic P.C.B. Ass'y**
		Serial Nos.: A31201001 — A31201907
	— Logic —	
IC401,402	0B06178A	IC μPD4011BC
403		
IC404	0B06143A	IC μPD4001BC
IC405	0B06124B	IC RC4558D
Q401,405	0B06100A	Transistor 2SC945 (A)
406,407		
408,409		
410,411		
412,413		
414,417		
419,420		
421,422		
423,429		
430,440		
447		
Q402,403	0B06013A	Transistor 2SA733
404,415		
416,418		
428,448		
Q424,426	0B06066A	Transistor 2SD471
Q425	0B06069A	Transistor 2SB564
Q427	0B06303A	Transistor 2SB772
D401-440	0B01909A	Silicon Diode 1S1555 (47 pcs.)
442,443		
444,468		
471,473		
476		
VR401	0B03832A	Semi-fixed Volume 100K
VR402,403	0B03831A	Semi-fixed Volume 5K
R401,402	0B05627A	Carbon Resistor 330K ERD-25T J
403,404		
405,406		
407,408		
409,410		
411,412		
416,417		
418,419		
421,422		
423,424		
425,429		
430,434		
435,436		
440,441		
442,447		
448,449		
450,457		
458,474		
475,481		
482,486		
513,517		
520,522		
570,599		
R413,466	0B05509A	Carbon Resistor 33K ERD-25T J
476,507		
607		
R414,437	0B05615A	Carbon Resistor 22K ERD-25T J
451,452		
453,454		
455,502		

Schematic Ref. No.	Part No.	Description
R415,488	0B09263A	Carbon Resistor 12K ERD-25T J
R420,471	0B09049A	Fail Safe Type Resistor 22 RDF-25S J
472		
R426,504	0B01682A	Carbon Resistor 6.8K ERD-25T J
588,598		
R427,428	0B05776A	Carbon Resistor 1M ERD-25T J
446,581		
582		
R431	0B05698A	Carbon Resistor 1.5K ERD-25T J
R432,433	0B05671A	Carbon Resistor 2.2M ERD-25T J
494,498		
503		
R438,439	0B05625A	Carbon Resistor 220K ERD-25T J
491		
R443	0B09367A	Metal Film Resistor 174K SN14K2E F
R445	0B09366A	Metal Film Resistor 287K SN14K2E F
R456,479	0B01888A	Carbon Resistor 10K ERD-25T J
490,506		
521,587		
597,628		
R459,464	0B01889A	Carbon Resistor 100K ERD-25T J
493,505		
509,510		
511,523		
525,580		
R461	0B09328A	Metal Film Resistor 9.1K SN14K2E F
R462	0B09365A	Metal Film Resistor 4.32K SN14K2E F
R465	0B09340A	Metal Film Resistor 15K SN14K2E F
R467,601	0B05743A	Carbon Resistor 27K ERD-25T J
R468,469	0B01856A	Carbon Resistor 8.2K ERD-25T J
R470	0B01933A	Carbon Resistor 220 ERD-25T J
R473,477	0B01681A	Carbon Resistor 3.3K ERD-25T J
485		
R478,487	0B01854A	Carbon Resistor 39K ERD-25T J
R480,499	0B05508A	Carbon Resistor 56K ERD-25T J
R483,484	0B01857A	Carbon Resistor 1K ERD-25T J
508		
R489	0B05640A	Carbon Resistor 180K ERD-25T J
R492	0B05680A	Carbon Resistor 1.8M ERD-25T J
R495,500	0B05692A	Carbon Resistor 68K ERD-25T J
501		
R496	0B01887A	Carbon Resistor 5.6K ERD-25T J
R497	0B09320A	Carbon Resistor 820K ERD-25T J
R512	0B09580A	Fail Safe Type Resistor 2.4 RDF-25S J
R518	0B09217A	Fail Safe Type Resistor 5.6 RDF-25S J
R519	0B05794A	Carbon Resistor 680 ERD-25T J
R524	0B05621A	Carbon Resistor 120K ERD-25T J
R526	0B05560A	Carbon Resistor 18K ERD-25T J
R584	0B01680A	Carbon Resistor 820 ERD-25T J
R585,586	0B05629A	Carbon Resistor 2.7K ERD-25T J
R590	0B09216A	Fail Safe Type Resistor 10 RDF-25S J
R600	0B05626A	Carbon Resistor 150K ERD-25T J
C401	0B01863A	Electrolytic Capacitor 3.3μ 16V
C402,403	0B05556A	Mylar Capacitor 4700P 50V
405,406		
C404	0B05582A	Mylar Capacitor 0.022μ 50V J
C407	0B00093A	Mylar Capacitor 0.1μ 50V
C408	0B01405A	Electrolytic Capacitor 1μ 50V
C409	0B09166A	Mylar Capacitor 3300P 50V
C410	0B00610A	Mylar Capacitor 0.15μ 50V
C411,414	0B01676A	Mylar Capacitor 0.056μ 50V
C412,413	0B09147A	Electrolytic Capacitor 3.3μ 25V (LN)
C415,422	0B09223A	Electrolytic Capacitor 1μ 50V (LN)
C416	0B09333A	Electrolytic Capacitor 4.7μ 25V (LN)

Schematic Ref. No.	Part No.	Description
C417	0B09277A	Ceramic Capacitor 10P 50V J
C419,464	0B01502A	Electrolytic Capacitor 330μ 16V
C421	0B01412A	Electrolytic Capacitor 10μ 16V
C450	0B01402A	Electrolytic Capacitor 4.7μ 25V
C457	0B09286A	Ceramic Capacitor 470P 50V K
C463	0B05513A	Mylar Capacitor 0.033μ 50V
CN4	0B08643A	7P-T Post
CN7	0B08653A	3P-T Post
CN8,13	0B08655A	11P-T Post
CN12	0B08644A	8P-T Post
	— RAMM —	
IC409	0B06127A	IC RC4559D
IC410	0B06250A	IC μPD4049BC
IC411	0B06143A	IC μPD4001BC
IC412	0B06214A	IC μPD4071BC
IC413	0B06213A	IC TC4013BP
IC414	0B06212A	IC TC4510BP
Q436	0B06070A	Transistor 2SC1636
Q437	0B06100A	Transistor 2SC945 (A)
D445	0B06181A	Silicon Diode 1SS53 (21 pcs.)
447-454		
456-464		
466,474		
475		
R532,534	0B01889A	Carbon Resistor 100K ERD-25T J
546,563		
564,572		
602		
R536	0B05641A	Carbon Resistor 47K ERD-25T J
R537	0B05622A	Carbon Resistor 2.2K ERD-25T J
R538	0B05621A	Carbon Resistor 120K ERD-25T J
R539	0B05623A	Carbon Resistor 1.2K ERD-25T J
R540,550	0B05627A	Carbon Resistor 330K ERD-25T J
551,554		
555,567		
608		
R541	0B05508A	Carbon Resistor 56K ERD-25T J
R542	0B01888A	Carbon Resistor 10K ERD-25T J
R543,545	0B05509A	Carbon Resistor 33K ERD-25T J
568,569		
571		
R544,562	0B01857A	Carbon Resistor 1K ERD-25T J
R547	0B05671A	Carbon Resistor 2.2M ERD-25T J
R548	0B05615A	Carbon Resistor 22K ERD-25T J
R552,553	0B05776A	Carbon Resistor 1M ERD-25T J
558		
R560	0B05625A	Carbon Resistor 220K ERD-25T J
R565,566	0B05676A	Carbon Resistor 390K ERD-25T J
C431,432	0B05687A	Mylar Capacitor 1200P 50V J
C433,444	0B01405A	Electrolytic Capacitor 1μ 50V
446		
C434	0B01863A	Electrolytic Capacitor 3.3μ 16V
C435	0B05557A	Mylar Capacitor 0.015μ 50V J
C436	0B05652A	Mylar Capacitor 4700P 50V J
C437	0B09222A	Electrolytic Capacitor 0.47μ 50V (LN)
C438	0B09287A	Ceramic Capacitor 680P 50V K
C439	0B00610A	Mylar Capacitor 0.15μ 50V
C440	0B05583A	Mylar Capacitor 0.033μ 50V J
C441	0B05682A	Mylar Capacitor 0.068μ 50V J
C442,443	0B09144A	Electrolytic Capacitor 0.22μ 50V (LN)
C459	0B09187A	Electrolytic Capacitor 1μ 50V (BP)
C461	0B01180A	Ceramic Capacitor 330P 50V K

Schematic Ref. No.	Part No.	Description
C462	0B09280A	Ceramic Capacitor 47P 50V J
	— Power Supply —	
IC420	0B06124B	IC RC4558D
Q432	0B06069A	Transistor 2SB564
Q433,452	0B06013A	Transistor 2SA733
455		
Q434,441	0B06066A	Transistor 2SD471
Q435,451	0B06100A	Transistor 2SC945 (A)
454		
Q450	0B06255A	Transistor 2SD880 (Y)
Q453	0B06256A	Transistor 2SB834 (Y)
ZD403,404	0B06231A	Zener Diode 11V RD11EB2
ZD405	0B06154A	Zener Diode 16V RD16EB3
ZD406	0B06167A	Zener Diode 6.2V RD6.2EB3
ZD407	0B06191A	Zener Diode 2.7V 2.7EB
D480	0B06183A	Diode Bridge RB151
D481,482	0B06109A	Silicon Diode GP08B
R528,530	0B09215A	Fail Safe Type Resistor 100 RDF-25S J
R529,531	0B09321A	Fail Safe Type Resistor 4.7 RDF-25S J
R586	0B05930A	Fail Safe Type Resistor 220 RDF-25S J
R610,611	0B01857A	Carbon Resistor 1K ERD-25T J
625		
R612,613	0B01679A	Carbon Resistor 100 ERD-25T J
R614,615	0B01846A	Carbon Resistor 4.7K ERD-25T J
R616,617	0B01888A	Carbon Resistor 10K ERD-25T J
620		
R618,619	0B01684A	Carbon Resistor 470K ERD-25T J
R621	0B09203A	Metal Film Resistor 10K SN14K2E F
R622	0B09433A	Metal Film Resistor 10.4K SN14K2E F
R623	0B09314A	Carbon Resistor 5.1K ERD-25T J
R626,627	0B09439A	Metal Film Resistor 20K SN14K2E F
C423	0B09398A	Electrolytic Capacitor 6800μ 16V
C425	0B01406A	Electrolytic Capacitor 2200μ 16V
C426	0B09374A	Electrolytic Capacitor 6800μ 25V
C427	0B05654A	Electrolytic Capacitor 2200μ 25V
C472,473	0B01272A	Electrolytic Capacitor 100μ 25V
	— Miscellaneous —	
	0B07987A	Logic P.C.B.
	0E00860A	BT Screw M3x6 Philips Binding Head (2 pcs.)
	0E00896A	Screw M3x6 Philips Binding Head (Chromate) (2 pcs.)
	0E00507A	Nut Hex. M3 (2 pcs.)
	0J04408B	Heat Sink C (1 pce.)

7.16. Auto Level P.C.B. Ass'y

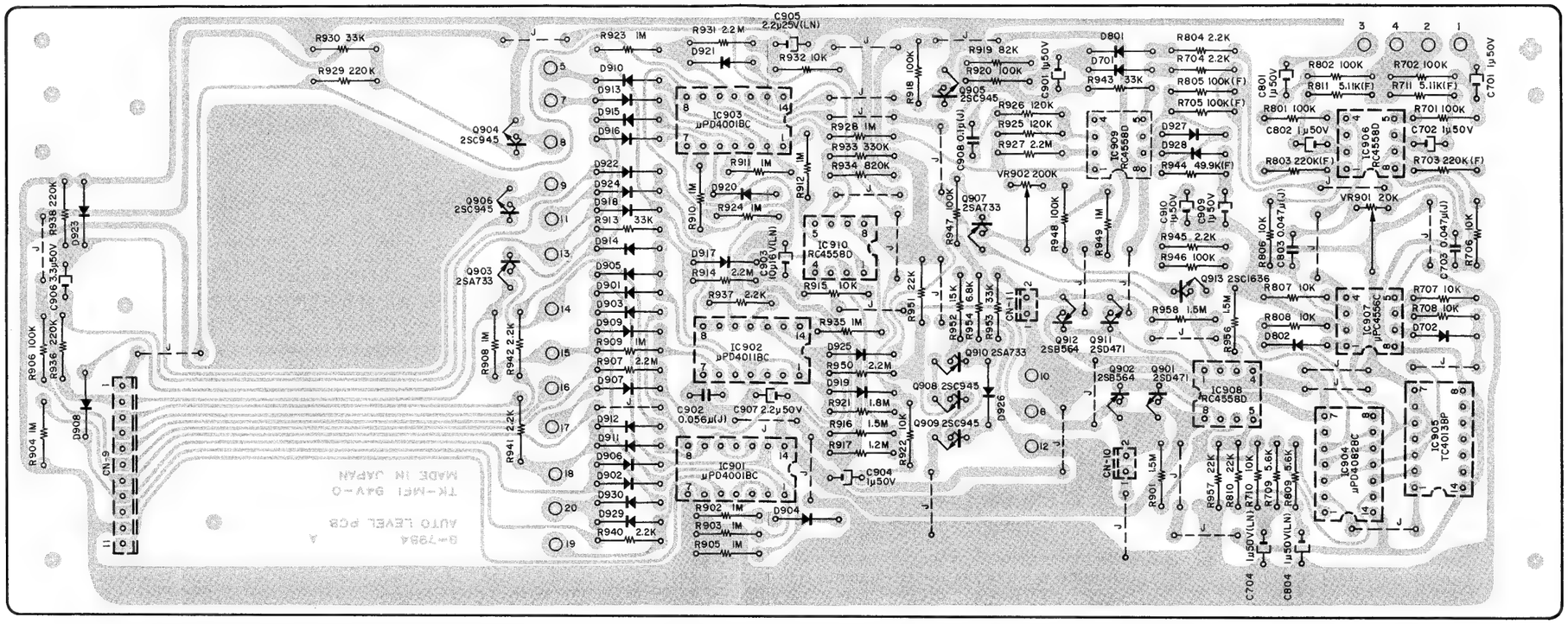


Fig. 7.16

Note: Diode is 1SS53 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA04492A	**Auto Level P.C.B. Ass'y**	920,946			R907,914	0B05671A	Carbon Resistor 2.2M ERD-25T J	C906	0B01863A	Electrolytic Capacitor 3.3μ 50V
			947,948			927,931			C907	0B09372A	Electrolytic Capacitor 2.2μ 50V
	0B07984A	Auto Level P.C.B.	R703,803	0B09472A	Metal Film Resistor 220K SN14K2E F	950			C908	0B01780A	Mylar Capacitor 0.1μ 50V J
IC901,903	0B06302A	IC μPD4001BC	R704,804	0B05622A	Carbon Resistor 2.2K ERD-25T J	R913,930	0B05509A	Carbon Resistor 33K ERD-25T J	CN9	0B08655A	11P-T Post
IC902	0B06178A	IC μPD4011BC	937,940			943,953			CN10,11	0B08656A	2P-T Post
IC904	0B06307A	IC μPD4082BC	941,942			R917	0B05962A	Carbon Resistor 1.2M ERD-25T J		0E00857A	BT Screw M3x6 Philips Binding Head
IC905	0B06213A	IC TC4013BP	945			R919	0B05668A	Carbon Resistor 82K ERD-25T J			(3 pcs.)
IC906,908	0B06124B	IC RC4558D	R705,805	0B09305A	Metal Film Resistor 100K SN14K2E F	R921	0B05680A	Carbon Resistor 1.8M ERD-25T J		0J04399A	Cal. P.C.B. Holder (1 pce.)
909,910			R706,707	0B01888A	Carbon Resistor 10K ERD-25T J	R925,926	0B05621A	Carbon Resistor 120K ERD-25T J			
IC907	0B06216A	IC μPC4556C	708,710			R929,936	0B05625A	Carbon Resistor 220K ERD-25T J			
Q901,911	0B06066A	Transistor 2SD471	806,807			938					
Q902,912	0B06069A	Transistor 2SB564	808,915			R933	0B05627A	Carbon Resistor 330K ERD-25T J			
Q903,907	0B06013A	Transistor 2SA733	922,932			R934	0B09320A	Carbon Resistor 820K ERD-25T J			
910			R709,809	0B01887A	Carbon Resistor 5.6K ERD-25T J	R944	0B09452A	Metal Film Resistor 49.9K SN14K2E F			
Q904,905	0B06100A	Transistor 2SC945 (A)	R711,811	0B09425A	Metal Film Resistor 5.11K SN14K2E F	R952	0B01683A	Carbon Resistor 15K ERD-25T J			
906,908			R810,951	0B05615A	Carbon Resistor 22K ERD-25T J	R954	0B01682A	Carbon Resistor 6.8K ERD-25T J			
909			957			C701,702	0B01405A	Electrolytic Capacitor 1μ 50V			
Q913	0B06070A	Transistor 2SC1636	R901,916	0B09380A	Carbon Resistor 1.5M ERD-25T J	801,802					
D701,702	0B06181A	Silicon Diode 1SS53 (34 pcs.)	956,958			901,904					
801,802			R902,903	0B05776A	Carbon Resistor 1M ERD-25T J	909,910					
901-930			904,905			C703,803	0B05796A	Mylar Capacitor 0.047μ 50V J			
VR901	0B07261A	Semi-fixed Volume 20K	908,909			C704,804	0B09223A	Electrolytic Capacitor 1μ 50V (LN)			
VR902	0B07154A	Semi-fixed Volume 200K	910,911			C902	0B05813A	Mylar Capacitor 0.056μ 50V J			
R701,702	0B01889A	Carbon Resistor 100K ERD-25T J	912,923			C903	0B09148A	Electrolytic Capacitor 10μ 16V (LN)			
801,802			924,928			C905	0B09332A	Electrolytic Capacitor 2.2μ 25V (LN)			
906,918			935,949								

8. MECHANISM ASS'Y AND PARTS LIST

8.1. Synthesis

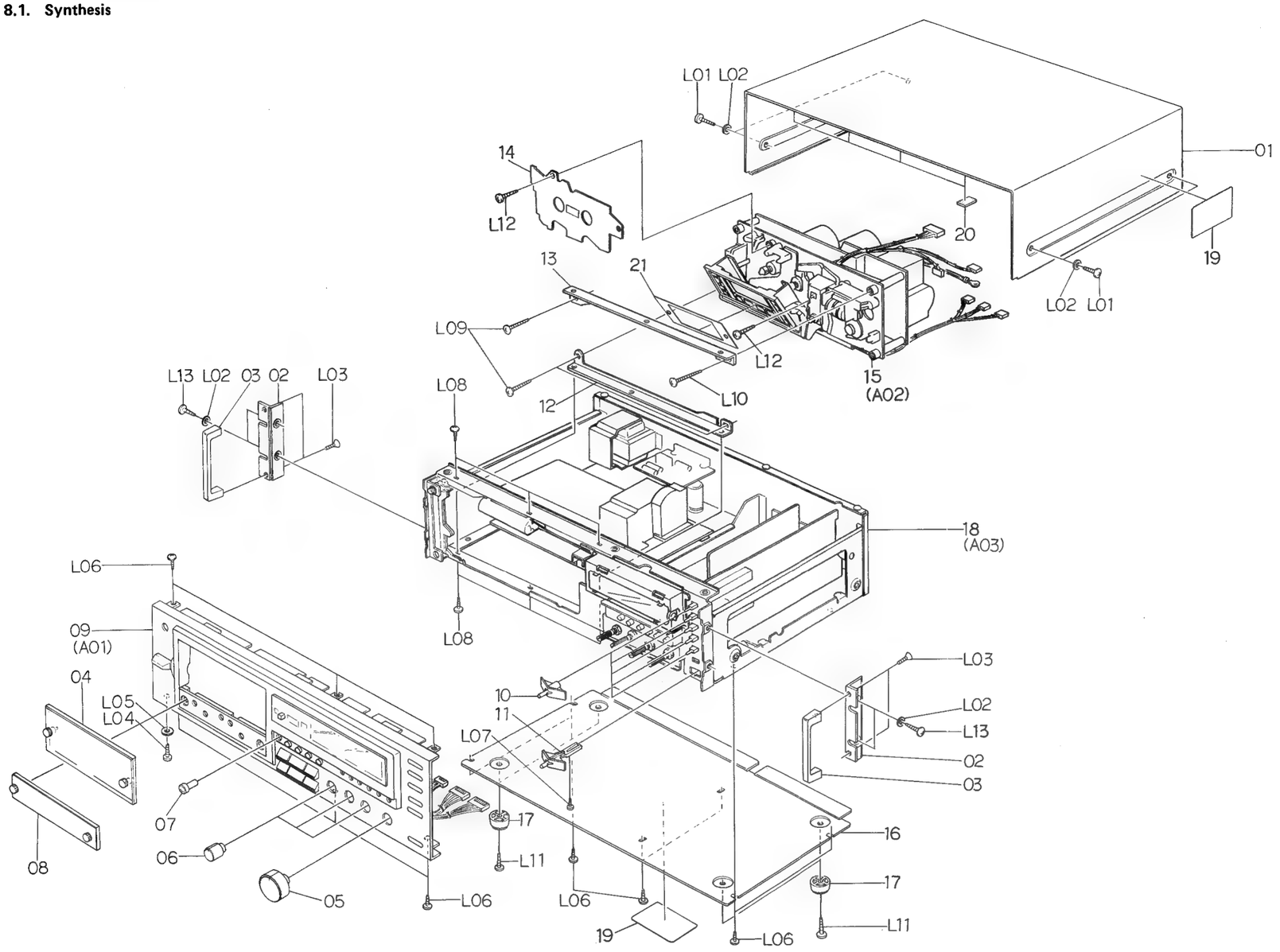


Fig. 8.1

Schematic Ref. No.	Part No.	Description	Q'ty
	HA04173A	**Synthesis (U.S.A. & Canada)**	**1**
	HA04174A	**Synthesis (Japan)**	**1**
	HA04175A	**Synthesis (220V Class 2)**	**1**
	HA04177A	**Synthesis (UK)**	**1**
	HA04176A	**Synthesis (Australia)**	**1**
	HA04178A	**Synthesis (Others)**	**1**
		Serial No.: A31201001 –	
01	0H03723D	Top Cover	1
02	0H03788B	Side Panel B	2
03	0H03763A	Handle B	2
04	HA03882A	Cassette Case Cover Ass'y	1
05	0H03732B	Volume Knob A	1
(05)	0H03733A	Volume Knob Sleeve A	1
06	0H03738B	Volume Knob B	3
(06)	0H03739A	Volume Knob Sleeve B	3
07	0H03725A	Pitch Control Knob	1
08	HA04202A	Azimuth Alignment Cover Ass'y	1
09	HA04200A	Front Panel Ass'y	1
10	HA03838B	Function Switch Knob Ass'y	6
11	0H03741A	Power Switch Knob	1
12	0J04158A	Mechanism Holder B	1
13	0J04157A	Mechanism Holder A	1
14	CA08259A	Cover Plate Ass'y	1
15	CA08305A	Mechanism Ass'y 681ZX	1
16	0H03757A	Bottom Cover	1
17	0J03825A	Leg S	4
18	JA03858A	Chassis Ass'y (U.S.A. & Canada)	1
	JA03859A	Chassis Ass'y (Japan)	1
	JA03860A	Chassis Ass'y (220V Class 2)	1
	JA03862A	Chassis Ass'y (UK)	1
	JA03861A	Chassis Ass'y (Australia)	1
	JA03863A	Chassis Ass'y (Others)	1
19	0M04101B	Caution Label	2
20	0J04080A	Top Cover Himelon	4
21	0H03758A	Cassette Case Plate	1
L01	0E00915A	BT Screw M4x8 Philips Binding Head (Black Chromate)	4
L02	0E00736A	Washer 4mm (Black Chromate)	8
L03	0E00908A	Screw M4x6 Philips Countersunk	4
L04	0E00921A	BT Screw M3x8 Philips Binding Head (Black Chromate)	1
L05	0E00677A	Washer 3mm (Black Plastics)	1
L06	0E00857A	BT Screw M3x6 Philips Binding Head	6
L07	0E00814A	BT Screw M2x4 Philips Pan Head	1
L08	0E00920A	Screw M3x6 Philips Polywave	6
L09	0E00944A	BT Screw M4x15 Philips Binding Head (Black Chromate)	3
L10	0E00924A	BT Screw M4x16 Philips Binding Head (Black Chromate)	1
L11	0E00852A	BT Screw M4x12 Philips Binding Head	4
L12	0E00832A	BT Screw M3x14 Philips Binding Head	2
–	0E00078A	Washer 4mm Toothed Lock	4

8.2. Front Panel Ass'y (A01)

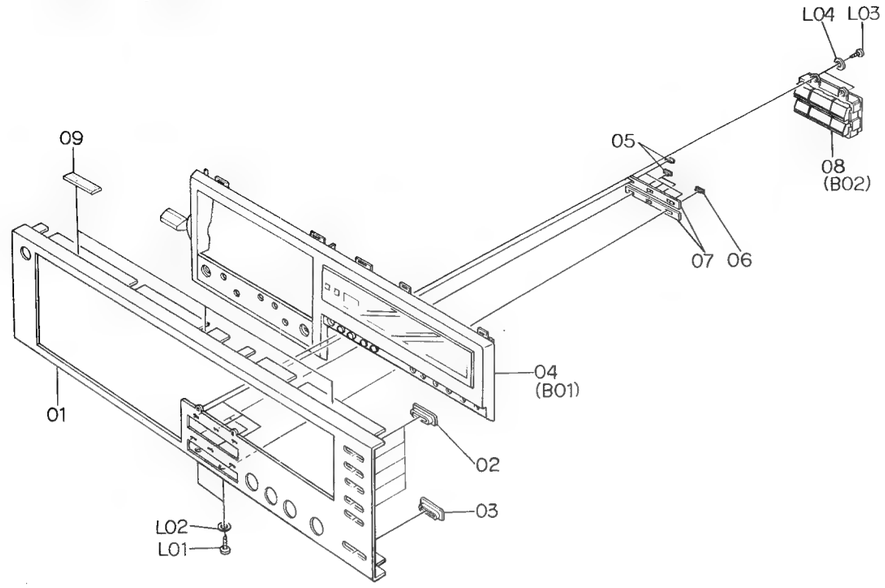


Fig. 8.2

Schematic Ref. No.	Part No.	Description	Q'ty
A01	**HA04200A**	**Front Panel Ass'y** Serial No.: A31201001 –	**1**
01	0H03979A	Front Panel	1
02	0H03746A	Function Switch Escutcheon	5
03	0H03747C	Power Switch Escutcheon	1
04	HA04185A	Front Panel Escutcheon Ass'y	1
05	0H03744B	Green Lens	5
06	0H03986A	Red Lens	1
07	0J04059B	Light Intercepting Seal	2
08	HA04187A	Control Button Ass'y	1
09	0H03781A	Cushion	3
L01	0E00825A	BT Screw M2.6x8 Philips Binding Head	2
L02	0E00912A	Washer FT25	2
L03	0E00794A	BT Screw M2x5 Philips Pan Head	2
L04	0E00117A	Washer 2mm	2

8.3. Mechanism Ass'y 681ZX (A02)

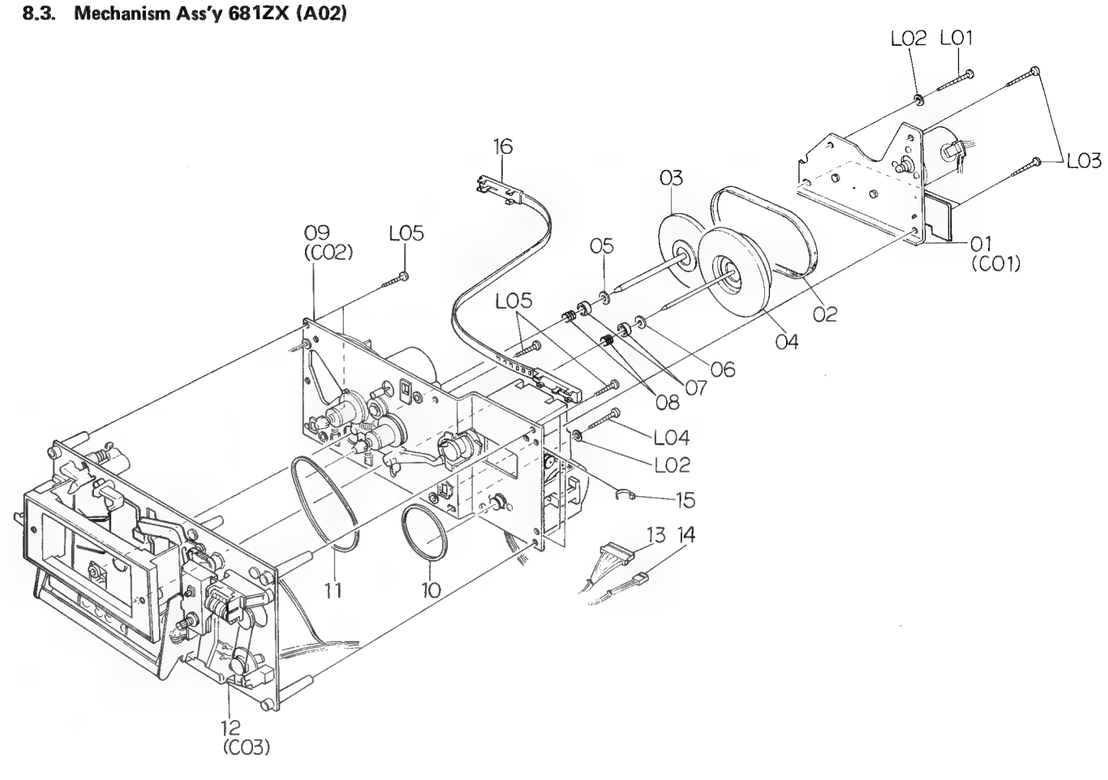


Fig. 8.3

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
A02	**CA08305A**	**Mechanism Ass'y 681ZX** Serial No.: A31201001 –	**1**	L01	0E00834A	BT Screw M3x30 Philips Pan Head	1
				L02	0E00178A	Washer 3mm	2
				L03	0E00833A	BT Screw M3x20 Philips Pan Head	3
				L04	0E00835A	BT Screw M3x25 Philips Pan Head	1
01	CA08247A	Flywheel Holder Ass'y	1	L05	0E00883A	BT Screw M3x18 Philips Pan Head	5
02	0C08096C	Capstan Belt	1				
03	CA08173A	Supply Flywheel Ass'y D	1				
04	CA08015A	Take-up Flywheel Ass'y	1				
05	0C08021B	Thrust Washer 3.1mm	1				
06	0C08020B	Thrust Washer 2.6mm	1				
07	0C08243A	Flange Thrust Cap	2				
08	0C08244A	Flange Thrust Spring	2				
09	CA08304A	Sub Mechanism Chassis Ass'y	1				
10	0C08099B	Control Motor Belt	1				
11	0C08098B	Counter Belt B	1				
12	CA08306A	Main Mechanism Chassis Ass'y	1				
13	0B08895A	11P-H Connector	1				
14	0B08652C	3P-H Connector	1				
15	0B08515A	Insh-Lock	15				
16	0C08237A	Azimuth Alignment Wire	1				
–	0M04289A	Mechanism Serial No. Seal	1				

8.4. Chassis Ass'y (A03)

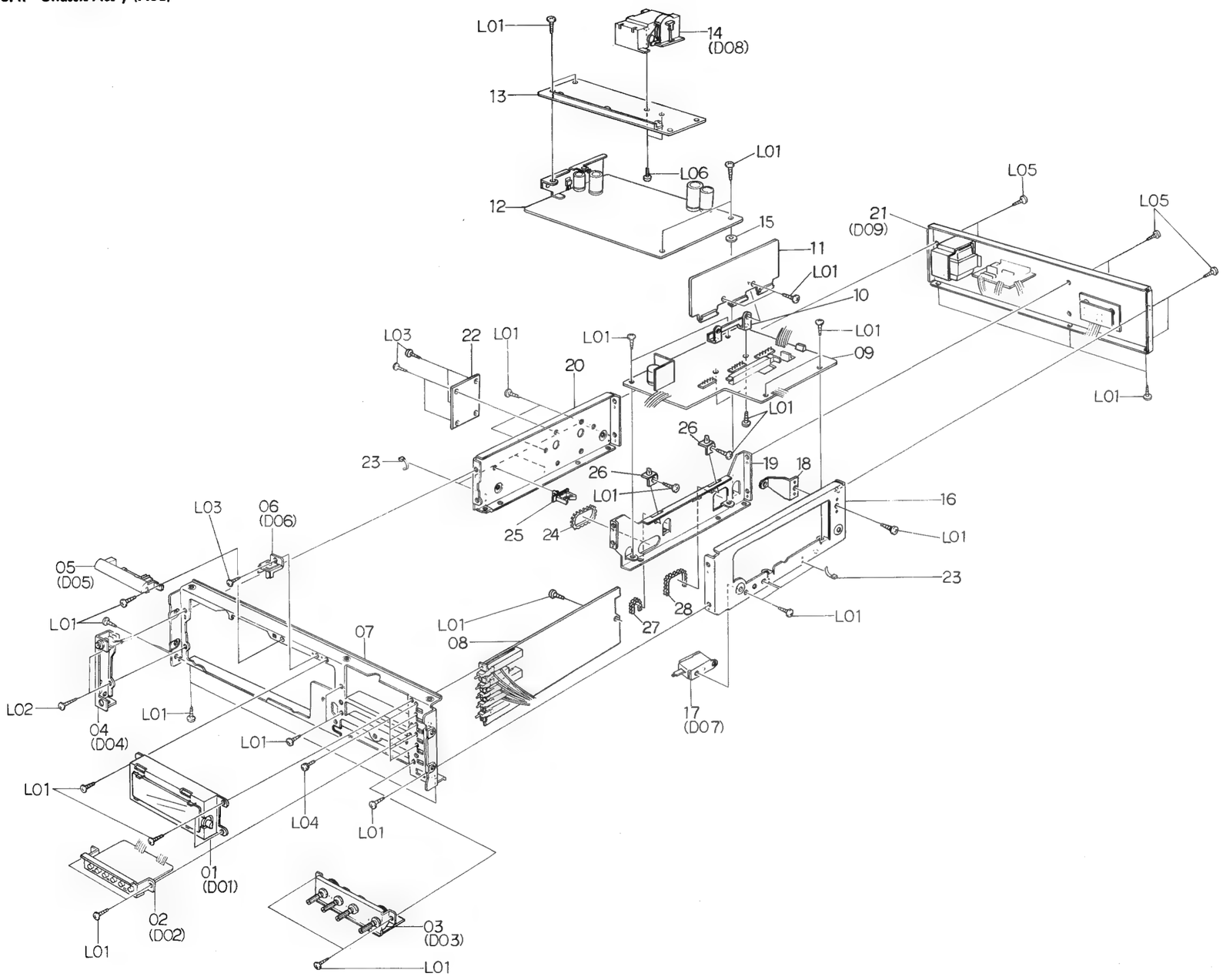


Fig. 8.4

Schematic Ref. No.	Part No.	Description	Q'ty
A03	**JA03858A**	**Chassis Ass'y (U.S.A. & Canada)**	**1**
	JA03859A	**Chassis Ass'y (Japan)**	**1**
	JA03860A	**Chassis Ass'y (220V Class 2)**	**1**
	JA03862A	**Chassis Ass'y (UK)**	**1**
	JA03861A	**Chassis Ass'y (Australia)**	**1**
	JA03863A	**Chassis Ass'y (Others)**	**1**
		Serial No.: A31201001 –	
01	JA03857A	FL Indicator Ass'y	1
02	JA03872A	Bias Calibration Ass'y	1
03	JA03871A	Volume Holder Ass'y	1
04	JA03659A	Headphone Jack Ass'y	1
05	JA03600A	Reflector Ass'y	1
06	JA03602A	Counter Lamp Ass'y	1
07	0J04034G	Front Chassis	1
08	BA04460A	Switch P.C.B. Ass'y	1
09	BA04462A	Main P.C.B. Ass'y	1
10	0J04416A	Dolby NR P.C.B. Holder A	1
11	BA04493A	Dolby NR P.C.B. Ass'y	1
12	BA04464A	Logic P.C.B. Ass'y	1
13	BA04492A	Auto Level P.C.B. Ass'y	1
14	JA03870A	Auto Level Motor Ass'y	1
15	0J04340A	P.C.B. Stopper Fiber	1
16	0J04033C	Side Chassis R	1
17	JA03592A	Power Switch Holder Ass'y (U.S.A. & Canada)	1
	JA03595A	Power Switch Holder Ass'y (Japan)	1
	JA03594A	Power Switch Holder Ass'y (220V Class 2, UK, Australia & Others)	1
18	0J04055B	Switch P.C.B. Holder	1
19	0J04407B	Center Chassis E	1
20	0J04031C	Side Chassis L	1
21	HA04188A	Rear Panel Ass'y (U.S.A. & Canada)	1
	HA04189A	Rear Panel Ass'y (Japan)	1
	HA04193A	Rear Panel Ass'y (220V Class 2)	1
	HA04191A	Rear Panel Ass'y (UK)	1
	HA04192A	Rear Panel Ass'y (Australia)	1
	HA04190A	Rear Panel Ass'y (Others)	1
22	0J04421A	Insulator E	2
23	0B08515A	Insu-Lock	23
24	0J04064A	Free Bushing 85mm	1
25	0B08580A	Wire Holder 161	1
26	0B08771A	Hinge	2
27	0J04436A	Free Bushing 52mm	1
28	0J04449A	Free Bushing 105mm	1
L01	0E00857A	BT Screw M3x6 Philips Binding Head	38
L02	0E00868A	BT Screw M3x8 Philips Binding Head	2
L03	0E00859A	BT Screw M2.6x6 Philips Binding Head	7
L04	0E00622A	Screw M3x5 Philips Pan Head(2A)	5
L05	0E00860A	BT Screw M3x6 Philips Binding Head (Black Chromate)	6
L06	0E00920A	Screw M3x6 Philips Polywave	2

8.5. Front Panel Escutcheon Ass'y (B01)

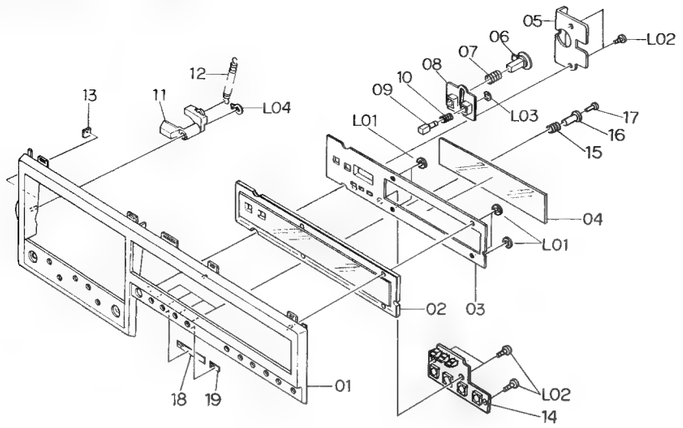


Fig. 8.5

8.6. Control Button Ass'y (B02)

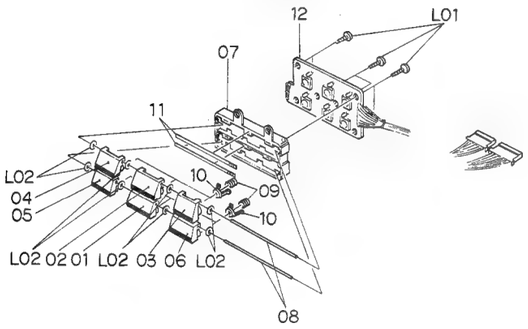


Fig. 8.6

8.7. Flywheel Holder Ass'y (C01)

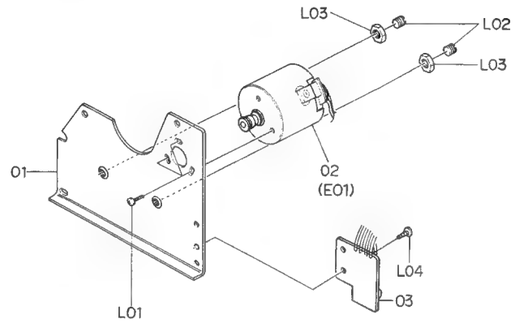


Fig. 8.7

Schematic Ref. No.	Part No.	Description	Q'ty
B01	**HA04185A**	**Front Panel Escutcheon Ass'y**	**1**
		Serial No.: A31201001 –	
01	HA04172A	Front Panel Escutcheon Sub Ass'y	1
02	0H03722B	Display Glass	1
03	0H03980A	Counter Escutcheon	1
04	0H03748A	FL Indicator Filter	1
05	0J04050A	Counter Escutcheon Holder	1
06	0H03749A	Memory Switch Knob	1
07	0J04043A	Memory Switch Knob Spring	1
08	0H03743B	CM Escutcheon	1
09	0H03750A	Counter Reset Knob	1
10	0J04042A	Counter Reset Knob Spring	1
11	0H03724F	Eject Lever	1
12	0H03762A	Eject Lever Spring	1
13	0J04057B	Eject Lever Cushion	1
14	BA04466A	Calibration Indicator P.C.B. Ass'y	1
15	0J04412B	Calibration Knob Spring	4
16	0H03984B	Calibration Knob	4
17	0J04435A	Calibration Knob A	4
18	0J04413A	Damp Sheet A	1
19	0J04414A	Damp Sheet B	1
L01	0E00874A	Stopper Ring 2mm	5
L02	0E00792A	BT Screw M2.6x6 Philips Pan Head (Chromate)	4
L03	0E00890A	C-Ring 2mm	1
L04	0E00837A	Stopper Ring 3mm	1
B02	**HA04187A**	**Control Button Ass'y**	**1**
		Serial No.: A31201001 –	
01	0H03726B	Control Button Stop	1
02	0H03727B	Control Button Play	1
03	0H03728B	Control Button F.F.	1
04	0H03729B	Control Button Rewind	1
05	0H03730B	Control Button Pause	1
06	0H03987A	Control Button Record	1
07	0J04044C	Control Button Holder	1
08	0J04045B	Control Button Shaft	2
09	0J04046A	Control Button Spring	6
10	0J04052B	Spring Stopper	6
11	0J04099A	Control Button Himelon	2

8.8. Sub Mechanism Chassis Ass'y (C02)

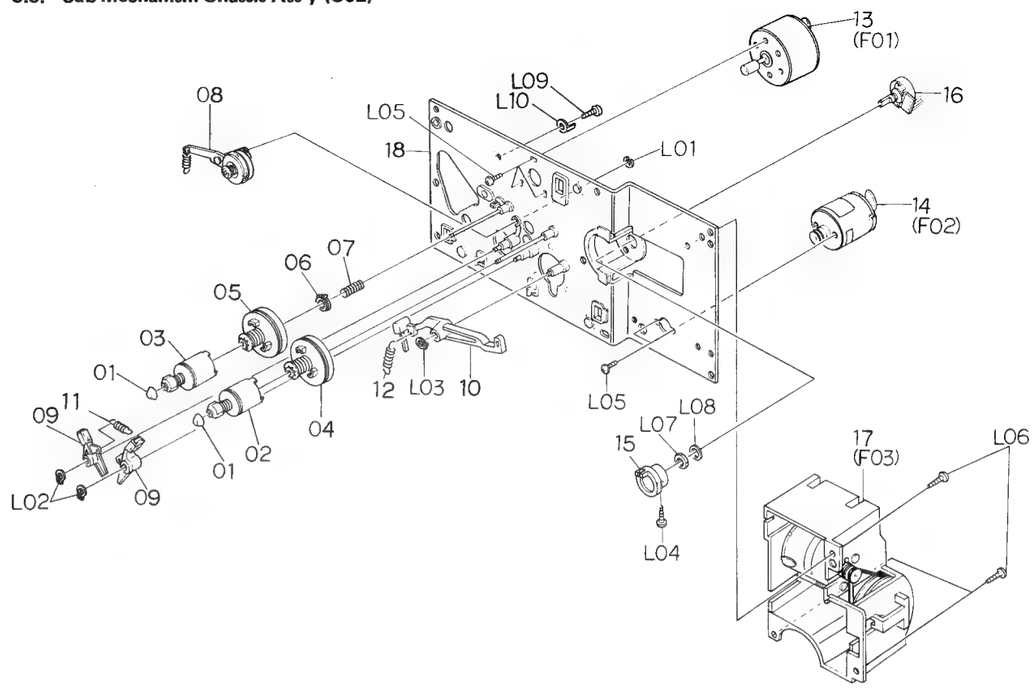


Fig. 8.8

Schematic Ref. No.	Part No.	Description	Q'ty
12	BA04071A	Control Switch P.C.B. Ass'y	1
L01	0E00792A	BT Screw M2.6x6 Philips Pan Head	6
L02	0J04061A	Washer FT20	8
C01	**CA08247A**	**Flywheel Holder Ass'y**	**1**
		Serial No.: A31201001 –	
01	0C08013I	Flywheel Holder	1
02	CA08246A	Capstan Motor Ass'y	1
03	BA04238A	Speed Cal. P.C.B. Ass'y	1
L01	0E00226A	Screw M2.6x4 Philips Pan Head	3
L02	0C08068C	Thrust Screw	2
L03	0C03857A	Lock Nut	2
L04	0E00843A	BT Screw M3x5 Philips Pan Head	1
C02	**CA08304A**	**Sub Mechanism Chassis Ass'y**	**1**
		Serial No.: A31201001 –	
01	0C08039B	Reel Hub Head	2
02	CA08038B	Reel Hub B Take-up Ass'y	1
03	CA08197A	Reel Hub B Supply Ass'y	1
04	CA08037A	Reel Hub Take-up Ass'y	1
05	CA08064A	Reel Hub Supply Ass'y	1
06	CA08039A	Back Tension Ass'y	1
07	0C08269A	Back Tension Spring C	1
08	CA08193A	Idler Ass'y	1
09	CA08042A	Brake Ass'y	2
10	0C08030C	Brake Drive Arm	1
11	0C08129A	Brake Arm Spring	1
12	0C08128A	Brake Drive Arm Spring	1
13	CA08242A	Reel Motor Ass'y	1
14	CA08034A	Control Motor Ass'y	1
15	0C08053B	Volume Coupler	1
16	0B07240A	Volume Control 10K (B)	1
17	CA08148A	Azimuth Alignment Motor Ass'y	1
18	CA08194A	Sub Chassis Ass'y	1
L01	0E00698A	E-Ring 2.5mm	1
L02	0E00837A	Stopper Ring 3mm	2
L03	0E00838A	Stopper Ring 4mm	1
L04	0E00859A	BT Screw M2.6x6 Philips Binding Head	1
L05	0E00226A	Screw M2.6x4 Philips Pan Head	5
L06	0E00846A	BT Screw M3x8 Philips Pan Head	3
L07	–	Volume Nut	(1)
L08	–	Volume Washer	(1)
L09	0E00843A	BT Screw M3x5 Philips Pan Head	1
L10	0E00037A	Earth Lug B-5	1

8.9. Main Mechanism Chassis Ass'y (C03)

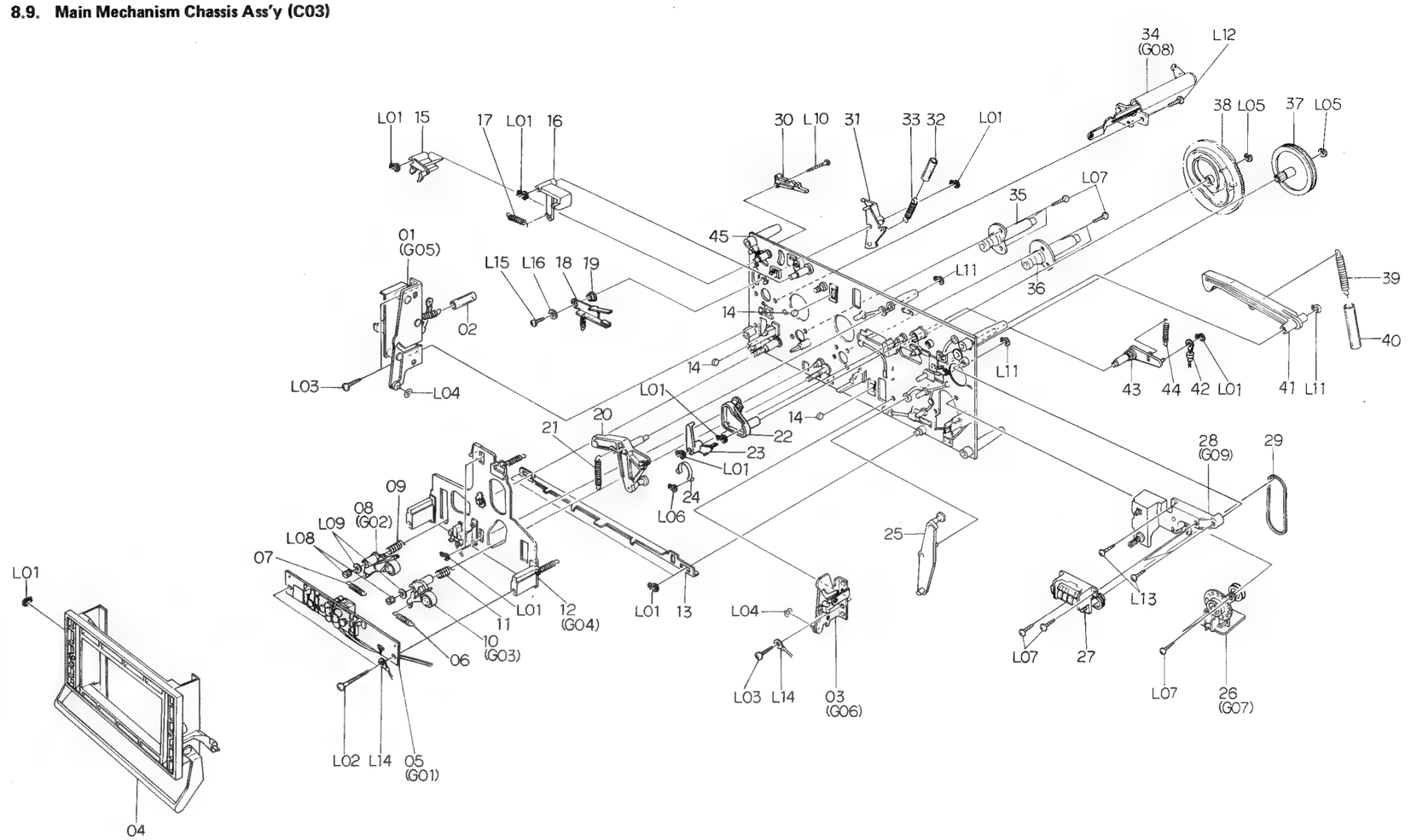


Fig. 8.9

Schematic Ref. No.	Part No.	Description	Q'ty
C03	CA08306A	**Main Mechanism Chassis Ass'y** Serial No.: A31201001 –	1
01	CA08125A	Cassette Case Holder L Ass'y	1
02	0C08151A	Lid Arm Spring Tube	1
03	CA08022A	Cassette Case Holder R Ass'y	1
04	CA08163A	Cassette Case Ass'y	1
05	CA08147A	Head Mount Base Ass'y	1
06	0C08121A	Supply Pressure Roller Spring	1
07	0C08250A	Supply Pressure Roller Spring B	1
08	CA08053B	Supply Pressure Roller Ass'y	1
09	0C08122B	Supply Pressure Roller Thrust Spring	1
10	CA08079B	Take-up Pressure Roller Ass'y	1
11	0C08183B	Take-up Pressure Roller Thrust Spring	1
12	CA08104A	Head Base Ass'y	1
13	0C08182A	Pressure Roller Drive Bar B	1
14	0C08086B	Head Base Roller	3
15	0C08050B	Record Sensor	1
16	0C08051E	Cassette Hold Arm	1
17	0C08120A	Cassette Hold Arm Spring	1
18	CA08196A	Back Tension Ass'y	1
19	0C08254A	Back Tension Arm Collar	1
20	CA08027A	Head Base Drive Arm Ass'y	1
21	0C08143C	Head Base Drive Arm Spring	1
22	CA08025A	Record Arm Ass'y	1
23	0C08038D	Record Trigger	1
24	0C08112A	Flip-Flop Spring	1
25	CA08026A	Pressure Roller Drive Arm Ass'y	1
26	CA08099A	Auto Shut-off Ass'y	1
27	CA08098A	Counter Ass'y	1
28	CA08105A	Pitch Control Holder Ass'y	1
29	0C08224A	Counter Belt	1
30	0C08119A	Record Protector	1
31	0C08194C	Damper Lock Arm	1
32	0C08153A	Damper Lock Arm Spring Tube	1
33	0C08125A	Damper Lock Arm Spring	1
34	CA08030A	Pneumatic Damper Ass'y	1
35	CA08023A	Supply Capstan Flange Ass'y	1
36	CA08024A	Take-up Capstan Flange Ass'y	1
37	0C08186A	Cam Drive Gear	1
38	0C08029H	Control Cam	1
39	0C08117A	Counter-Load Arm Spring	1
40	0C08152A	Counter-Load Arm Spring Tube	1
41	CA08028A	Counter-Load Arm Ass'y	1
42	0C08297A	Record Switch Linkage Wire	1
43	0C08037E	Record Arm B	1
44	0C08116A	Record Arm Spring	1
45	CA08072A	Main Chassis Ass'y	1
L01	0E00837A	Stopper Ring 3mm	12
L02	0E00834A	BT Screw M3x30 Philips Pan Head	2
L03	0E00831A	BT Screw M3x10 Philips Pan Head	3
L04	0E00254A	Washer 3.1mm (Plastics)	2
L05	0E00222A	E-Ring 2mm	2
L06	0E00839A	Stopper Ring 2.5mm	1
L07	0E00876A	Screw M2.6x8 Philips Pan Head	11
L08	0C08060B	Height Adjustment Nut	2
L09	0E00142A	Washer 2.6mm	2
L10	0E00879A	BT Screw M2x15 Philips Pan Head	1
L11	0E00838A	Stopper Ring 4mm	3

Schematic Ref. No.	Part No.	Description	Q'ty
L12	0E00846A	BT Screw M3x8 Philips Pan Head	3
L13	0E00828A	BT Screw M2.6x8 Philips Binding Head (Chromate)	3
L14	0E00895A	Earth Lug 3mm	2

8.10. FL Indicator Ass'y (D01)

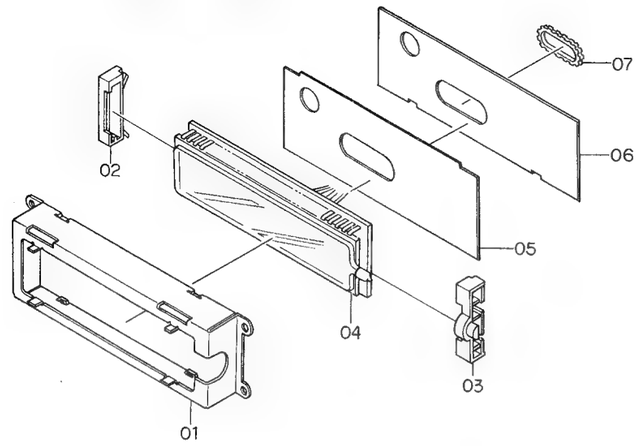


Fig. 8.10

8.11. Bias Calibration Ass'y (D02)

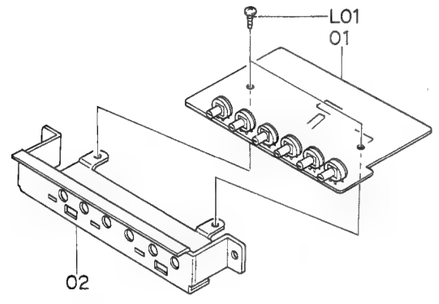


Fig. 8.11

8.12. Volume Holder Ass'y (D03)

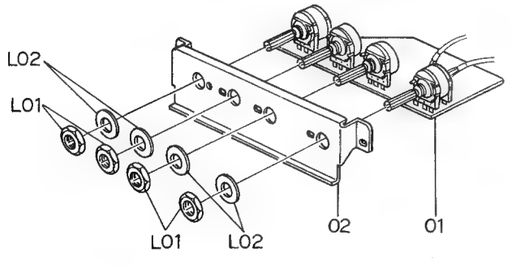


Fig. 8.12

8.13. Headphone Jack Ass'y (D04)

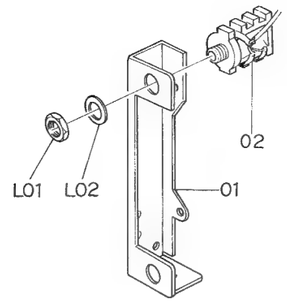


Fig. 8.13

8.14. Reflector Ass'y (D05)

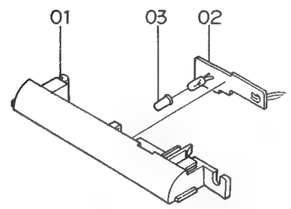


Fig. 8.14

8.15. Counter Lamp Ass'y (D06)

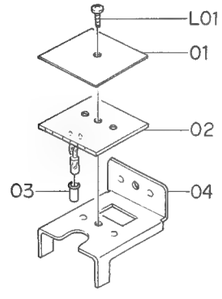


Fig. 8.15

8.16. Power Switch Holder Ass'y (D07)

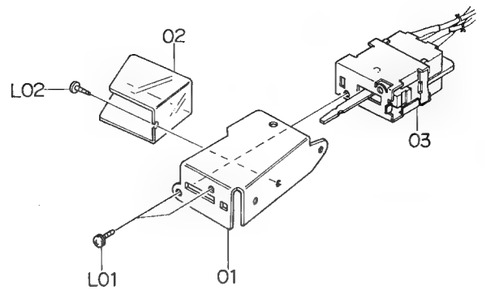


Fig. 8.16

8.17. Auto Level Motor Ass'y (D08)

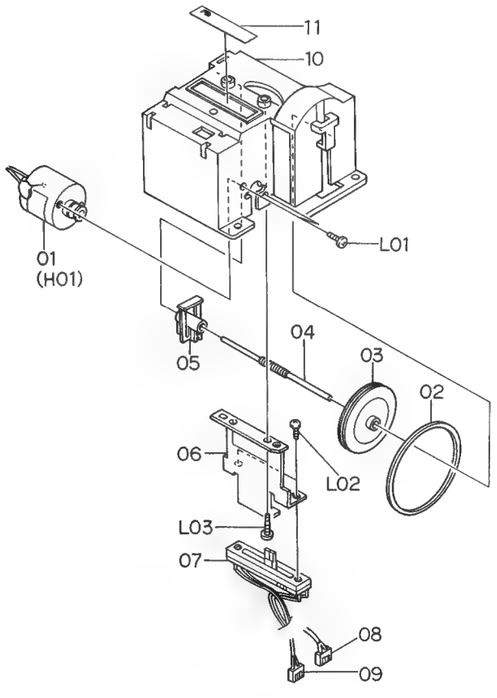


Fig. 8.17

Schematic Ref. No.	Part No.	Description	Q'ty
D01	**JA03857A**	**FL Indicator Ass'y** Serial No.: A31201001 –	**1**
01	0J04400A	Shield Cover	1
02	0J04402A	FL Indicator Holder L	1
03	0J04401A	FL Indicator Holder R	1
04	BA04459A	FL Indicator P.C.B. Ass'y	1
05	0J04404B	Indicator P.C.B. Plate	1
06	0J04403A	FL Indicator Hold Plate	3
07	0J04415A	Free Bushing 70mm	1
D02	**JA03872A**	**Bias Calibration Ass'y** Serial No.: A31201001 –	**1**
01	BA04468A	Bias Cal. P.C.B. Ass'y	1
02	0J04102B	Cal. P.C.B. Holder	1
L01	0E00856A	BT Screw M3x5 Philips Binding Head	2
D03	**JA03871A**	**Volume Holder Ass'y** Serial No.: A31201001 –	**1**
01	BA04469A	Volume P.C.B. Ass'y	1
02	0J04100A	Volume Holder	1
L01	–	Volume Nut	(4)
L02	–	Volume Washer	(4)
D04	**JA03659A**	**Headphone Jack Ass'y** Serial No.: A31201001 –	**1**
01	0J04101A	Headphone Jack Holder	1
02	0B08511A	Headphone Jack	1
L01	–	Headphone Jack Nut	(1)
L02	–	Headphone Jack Washer	(1)
D05	**JA03600A**	**Reflector Ass'y** Serial No.: A31201001 –	**1**
01	0H03754C	Reflector	1
02	BA04063A	Lamp P.C.B. C Ass'y	1
03	0J04107A	Filter Cap	1
D06	**JA03602A**	**Counter Lamp Ass'y** Serial No.: A31201001 –	**1**
01	0J04083A	Insulator	1
02	BA04062A	Lamp P.C.B. B Ass'y	1
03	0J04107A	Filter Cap	1
04	0J04041A	Counter Lamp P.C.B. Holder	1
L01	0E00859A	BT Screw M2.6x6 Philips Binding Head	1

Schematic Ref. No.	Part No.	Description	Q'ty
D07	**JA03592A**	**Power Switch Holder Ass'y (U.S.A. & Canada)**	**1**
	JA03595A	**Power Switch Holder Ass'y (Japan)**	**1**
	JA03594A	**Power Switch Holder Ass'y (220V Class 2, UK, Australia & Others)**	**1**
		Serial No.: A31201001 –	
01	0J04038A	Power Switch Holder	1
02	0J04056A	Power Switch Insulator	1
03	0B07280A	Power Switch (U.S.A. & Canada)	1
	0B07291A	Power Switch (Japan)	1
	0B07292A	Power Switch (220V Class 2, UK, Australia & Others)	1
L01	0E00622A	Screw M3x5 Philips Pan Head (2A)	2
L02	0E00873A	BT Screw M2.6x5 Philips Binding Head	1
D08	**JA03870A**	**Auto Level Motor Ass'y**	**1**
		Serial No.: A31201001 –	
01	CA08149A	Azimuth Motor Ass'y	1
02	0C08099B	Auto Level Motor Belt	1
03	0C08229B	Drive Pulley	1
04	0C08230B	Drive Pulley Shaft	1
05	0J04405A	Volume Drive Jointer	1
06	0J04406A	Volume Holder	1
07	0B07386A	Volume 10K	1
08	0B08899A	2P-H Connector (White)	1
09	0B08900A	2P-H Connector (Red)	1
10	0C08233H	Drive Unit Base	1
11	0M04282A	Auto Level Unit Seal	1
L01	0E00226A	Screw M2.6x4 Philips Pan Head	2
L02	0E00922A	Screw M2x3 Philips Pan Head	2
L03	0E00825A	BT Screw M2.6x8 Philips Binding Head (Black Chromate)	2
D09	**HA04188A**	**Rear Panel Ass'y (U.S.A. & Canada)**	**1**
	HA04189A	**Rear Panel Ass'y (Japan)**	**1**
	HA04193A	**Rear Panel Ass'y (220V Class 2)**	**1**
	HA04191A	**Rear Panel Ass'y (UK)**	**1**
	HA04192A	**Rear Panel Ass'y (Australia)**	**1**
	HA04190A	**Rear Panel Ass'y (Others)**	**1**
		Serial No.: A31201001 –	
01	0H03996A	Rear Panel	1
02	BA04485A	Pin Jack P.C.B. Ass'y	1
03	0B08355A	4P DIN Socket	1
04	0B08584A	8P DIN Socket	1
05	BA04095A	Fuse P.C.B. Ass'y (U.S.A. & Canada)	1
	BA04096A	Fuse P.C.B. Ass'y (Japan)	1
	BA04105B	Fuse P.C.B. Ass'y (220V Class 2)	1
	BA04098B	Fuse P.C.B. Ass'y (UK & Australia)	1
	BA04097B	Fuse P.C.B. Ass'y (Others)	1
06	0C01162B	Bolt Receptacle Plate	2
07	0B06672B	Power Transformer (U.S.A. & Canada)	1
	0B06619B	Power Transformer (Japan)	1
	0B06621B	Power Transformer (220V Class 2, UK & Australia)	1
	0B06620C	Power Transformer (Others)	1
08	0J04442A	Transformer Shield Holder	1
09	0J04016A	Transformer Plate	1
10	0B08037U	Cord Bushing C (U.S.A., Canada, Japan, 220V Class 2, Australia & Others)	1
	0B08351A	Cord Bushing 4K-4 (UK)	1
11	0B08533A	Power Cord (U.S.A., Canada & Others)	1
	0B08219B	Power Cord (Japan)	1
	0B08093U	Power Cord (220V Class 2)	1
	0B08348A	Power Cord (UK)	1
	0B05241A	Power Cord (Australia)	1
12	0A03154B	Cord Spacer	1
13	0J03663C	Switch Cover (U.S.A., Canada, Japan, 220V Class 2, UK & Australia)	1
	0M03946A	Voltage Selector Lock Plate C (Others)	1
14	0B07092U	Voltage Selector (Others)	1
15	0J04079A	Cushion B	3
16	0M03458B	Pass Label	1
17	0M04075A	Fuse Caution Label (U.S.A. & Canada)	1
18	0M04284A	Voltage Label 100V (Japan)	1
	0M03796A	Voltage Label 220V (220V Class 2)	1
	0M03797A	Voltage Label 240V (UK & Australia)	1
	0M04293A	Voltage Label 120V/220-240V (Others)	1
–	0M03844B	Power Cord Label (UK)	1
–	0F01071A	Free-up Belt (220V Class 2, UK & Australia)	1
–	0M04290A	Serial Number Plate	1
L01	0B08720A	Plastic Rivet	4
L02	0E00594A	Screw M3x8 Philips Binding Head (Bronze)	3
L03	0E00507A	Nut Hex. M3	3
L04	0E00581A	Washer 3mm (Spring)	1
L05	0E00714A	Screw M2.6x6 Philips Binding Head (Bronze)	4
L06	0E00593A	Screw M3x6 Philips Binding Head (Bronze)	2
L07	0E00756A	Screw M4x8 Philips Binding Head (Bronze)	2
–	0J03644A	Chobert Rivet	2
–	0M04113A	LA Label (U.S.A. & Canada)	1

8.18. Rear Panel Ass'y (D09)

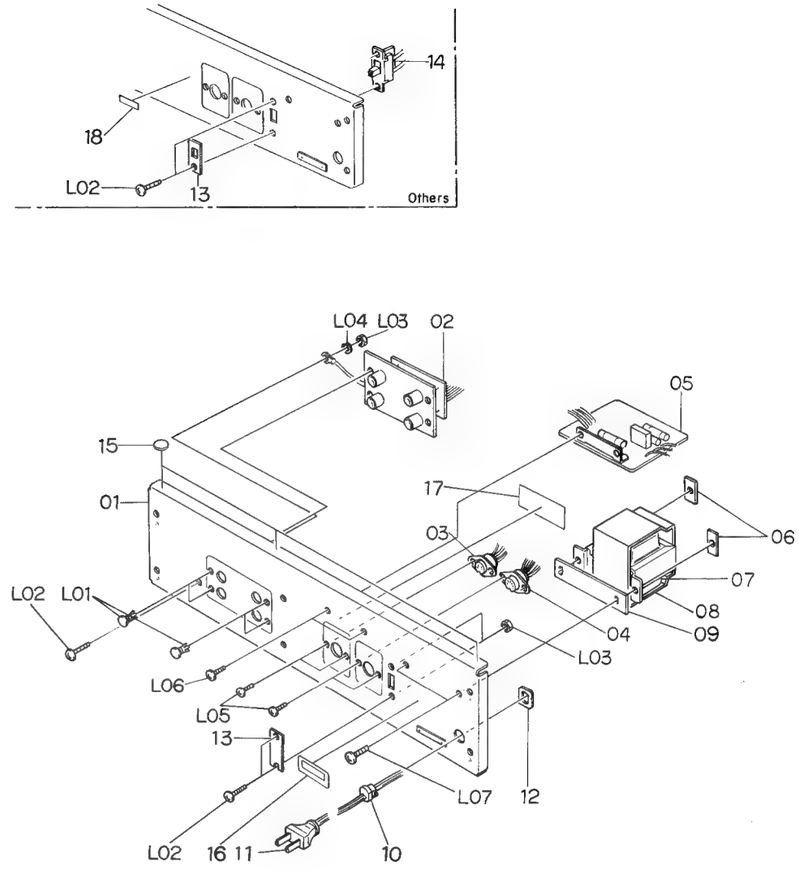


Fig. 8.18

8.19. Capstan Motor Ass'y (E01)

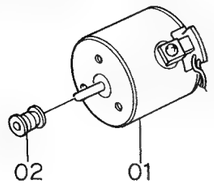


Fig. 8.19

8.20. Reel Motor Ass'y (F01)

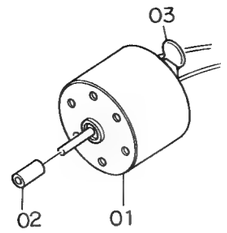


Fig. 8.20

8.21. Control Motor Ass'y (F02)

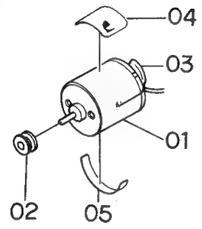


Fig. 8.21

8.22. Azimuth Alignment Motor Ass'y (F03)

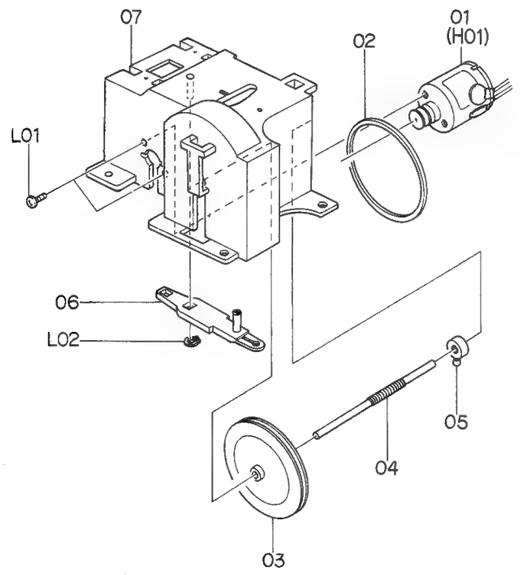


Fig. 8.22

8.23. Head Mount Base Ass'y (G01)

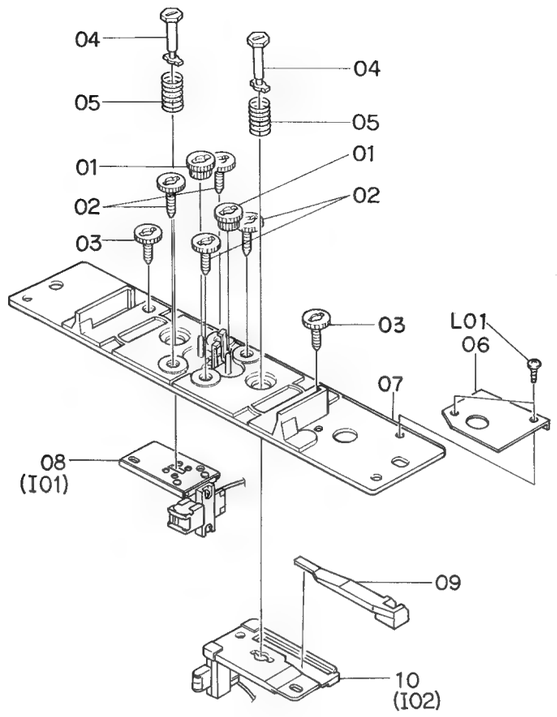


Fig. 8.23

8.24. Supply Pressure Roller Ass'y (G02)

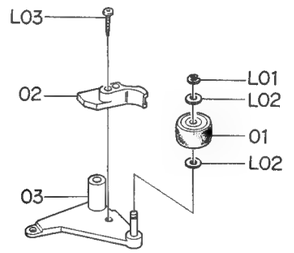


Fig. 8.24

8.25. Take-up Pressure Roller Ass'y (G03)

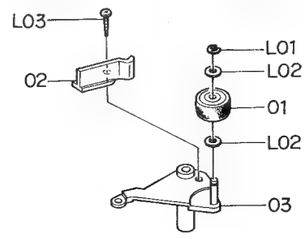


Fig. 8.25

8.26. Head Base Ass'y (G04)

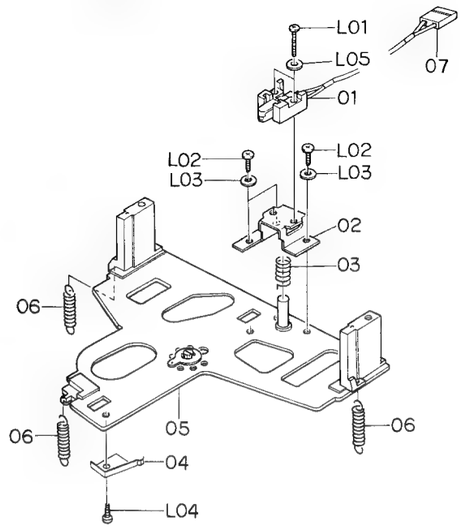


Fig. 8.26

8.27. Cassette Case Holder L Ass'y (G05)

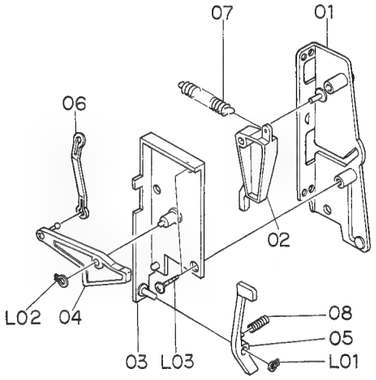


Fig. 8.27

8.28. Cassette Case Holder R Ass'y (G06)

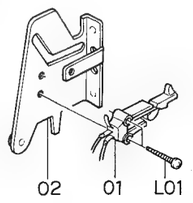


Fig. 8.28

Schematic Ref. No.	Part No.	Description	Q'ty
E01	**CA08246A**	**Capstan Motor Ass'y** Serial No.: A31201001 —	**1**
01	0C08079G	Motor Pulley	1
02	0C08271A	Capstan Motor	1
F01	**CA08242A**	**Reel Motor Ass'y** Serial No.: A31201001 —	**1**
01	0C08272A	Reel Motor	1
02	0C08063F	Reel Motor Pulley	1
03	0B09290A	Ceramic Capacitor 0.01μ 50V Z	1
F02	**CA08034A**	**Control Motor Ass'y** Serial No.: A31201001 —	**1**
01	0C08137A	Control Motor	1
02	0C08064A	Control Motor Pulley	1
03	0B09292A	Ceramic Capacitor 0.1μ 50V Z	1
04	0M03985A	Control Motor Label	1
05	0M03988A	Motor Seal B	1
F03	**CA08148A**	**Azimuth Alignment Motor Ass'y** Serial No.: A31201001 —	**1**
01	CA08149A	Azimuth Motor Ass'y	1
02	0C08099B	Control Motor Belt	1
03	0C08229B	Drive Pulley	1
04	0C08230B	Drive Pulley Shaft	1
05	0C08231C	Drive Nut	1
06	0C08232C	Drive Bar	1
07	0C08233G	Drive Unit Base	1
08	0M04126A	Azimuth Alignment Unit Seal	1
L01	0E00226A	Screw M2.6x4 Philips Pan Head	2
L02	0E00837A	Stopper Ring 3mm	1
G01	**CA08147A**	**Head Mount Base Ass'y** Serial No.: A31201001 —	**1**
01	0C08028C	Head Height Adjustment Gear	2
02	0C08027F	Head Height Adjustment Screw	4
03	0C08026D	Azimuth Alignment Screw	2
04	0C08161B	Spring Stopper	2
05	0C08187B	Head Plate Spring	2
06	0C08236A	Azimuth Alignment Wire Hold Plate	1
07	CA08083C	Head Mount Base Sub Ass'y	1
08	CA08158A	P-8L Playback Head Ass'y	1
09	0C08235A	Azimuth Alignment Plate	1
10	CA08150A	R-8L Record Head Ass'y	1
L01	0E00917A	BT Screw M2.6x5 Philips Pan Head	2

Schematic Ref. No.	Part No.	Description	Q'ty
G02	**CA08053B**	**Supply Pressure Roller Ass'y** Serial No.: A31201001 —	**1**
01	0C08164G	Pressure Roller	1
02	0C08189C	Supply Tape Guide	1
03	CA08061A	Supply Pressure Roller Arm Ass'y	1
L01	0E00042A	E-Ring 1.5mm	1
L02	0C08024A	Washer 2mm	2
L03	0E00788A	BT Screw M2x8 Philips Pan Head	1
G03	**CA08079B**	**Take-up Pressure Roller Ass'y** Serial No.: A31201001 —	**1**
01	0C08164G	Pressure Roller	1
02	0C08181C	Take-up Tape Guide	1
03	CA08073B	Take-up Pressure Roller Arm Ass'y	1
L01	0E00042A	E-Ring 1.5mm	1
L02	0C08024A	Washer 2mm	2
L03	0E00788A	BT Screw M2x8 Philips Pan Head	1
G04	**CA08104A**	**Head Base Ass'y** Serial No.: A31201001 —	**1**
01	GA02083A	E0K Erase Head	1
02	0C08158D	Erase Head Hold Plate	1
03	0C08166A	Erase Head Hold Plate Spring	1
04	0C08174D	Cassette Hold Spring	1
05	CA08003Q	Head Base Ass'y	1
06	0C08175A	Head Base L Spring	3
07	0B08905A	2P-H Connector	1
L01	0E00951A	Screw M1.7x7 Philips Pan Head	2
L02	0E00909A	Screw M2x6 Philips Pan Head	3
L03	0E00117A	Washer 2mm	3
L04	0E00853A	BT Screw M2x3 Philips Pan Head	1
L05	0E00952A	Washer 1.7mm	2
G05	**CA08125A**	**Cassette Case Holder L Ass'y** Serial No.: A31201001 —	**1**
01	CA08090F	Cassette Case Holder L Sub Ass'y	1
02	0C08073C	Lid Arm A	1
03	0C08195G	Eject Arm Holder	1
04	0C08196B	Eject Arm A	1
05	0C08197C	Eject Arm B	1
06	0C08199B	Eject Arm Joint	1
07	0C08114A	Lid Arm Spring	1
08	0C08211C	Eject Arm Spring	1
L01	0E00837A	Stopper Ring 3mm	1
L02	0E00838A	Stopper Ring 4mm	1
L03	0E00865A	BT Screw M3x10 Philips Binding Head	2
G06	**CA08022A**	**Cassette Case Holder R Ass'y** Serial No.: A31201001 —	**1**
01	0C08133A	Eject Sensor	1
02	CA08044A	Cassette Case Holder R Sub Ass'y	1
L01	0E00840A	BT Screw M2x8 Philips Pan Head	2

8.29. Auto Shut-off Ass'y (G07)

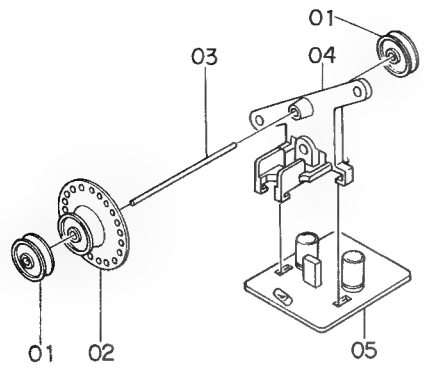


Fig. 8.29

8.30. Pneumatic Damper Ass'y (G08)

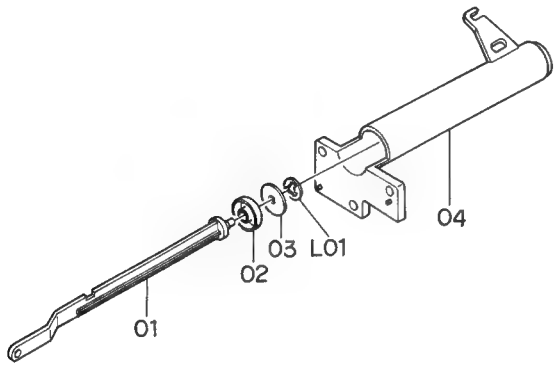


Fig. 8.30

8.31. Pitch Control Holder Ass'y (G09)

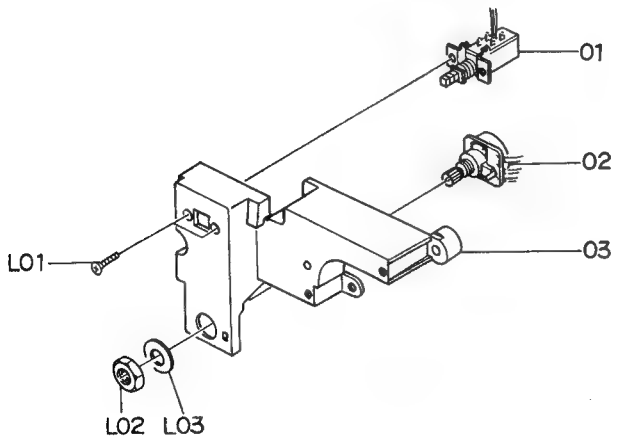


Fig. 8.31

8.32. Azimuth Motor Ass'y (H01)

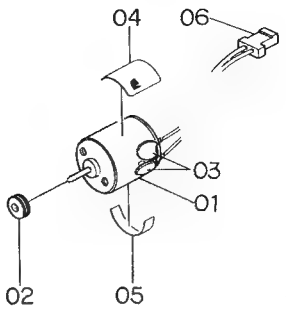


Fig. 8.32

8.33. P-8L Playback Head Ass'y (I01)

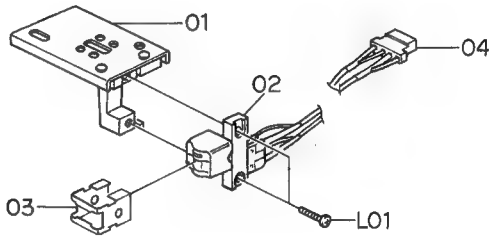
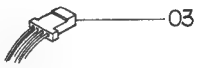


Fig. 8.33

8.34. R-8L Record Head Ass'y (I02)



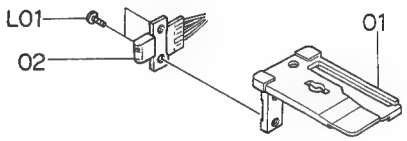


Fig. 8.34

Schematic Ref. No.	Part No.	Description	Q'ty
G07	**CA08099A**	**Auto Shut-off Ass'y** Serial No.: A31201001 –	**1**
01	0C08047A	Shut-off Pulley A	2
02	0C08206B	Shut-off Pulley B	1
03	0C08210A	Shut-off Pulley Shaft	1
04	0C08207B	Shut-off Pulley Holder	1
05	BA04070A	Shut-off P.C.B. Ass'y	1
G08	**CA08030A**	**Pneumatic Damper Ass'y** Serial No.: A31201001 –	**1**
01	0C08058C	Damper Piston	1
02	0C08102C	Damper Ring	1
03	0C08010C	Damper Plate	1
04	0C08059D	Sylinder	1
L01	0E00874A	Stopper Ring CS 2mm	1
G09	**CA08105A**	**Pitch Control Holder Ass'y** Serial No.: A31201001 –	**1**
01	0B07283A	Memory Switch	1
02	0B07282A	Volume Control 20K (B)	1
03	0C08214D	Pitch Control Holder	1
L01	0E00125A	Screw M2x6 Philips Countersunk	2
L02	–	Volume Nut	(1)
L03	–	Volume Washer	(1)

Schematic Ref. No.	Part No.	Description	Q'ty
H01	**CA08149A**	**Azimuth Motor Ass'y** Serial No.: A31201001 –	**1**
01	0C08137A	Control Motor	1
02	0C08064A	Control Motor Pulley	1
03	0B09292A	Ceramic Capacitor 0.1μ 50V Z	2
04	0M03985A	Motor Label 730	1
05	0M03988A	Motor Seal A	1
06	0B08708A	2P Connector	1
I01	**CA08158A**	**P-8L Playback Head Ass'y** Serial No.: A31201001 –	**1**
01	CA08307A	Playback Head Plate Ass'y	1
02	GA02034A	P-8LH Playback Head	1
03	0C08169D	Pad Lifter 54	1
04	0B08647E	4P-H Connector	1
L01	0E00886A	Screw M1.7x6.5 Philips Pan Head	2
I02	**CA08150A**	**R-8L Record Head Ass'y** Serial No.: A31201001 –	**1**
01	0C08234B	Record Head Plate	1
02	GA01050A	R-8LH Record Head	1
03	0B08648D	4P-H Connector	1
L01	0E00887A	Screw M1.7x4 Philips Pan Head	2

9. OVERALL TIMING CHART

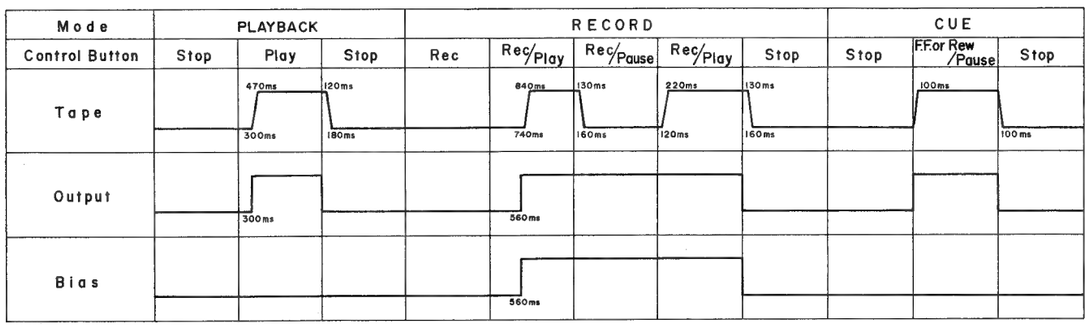


Fig. 9

10. EQ. AMP. FREQUENCY RESPONSE

10.1. Playback Frequency Response

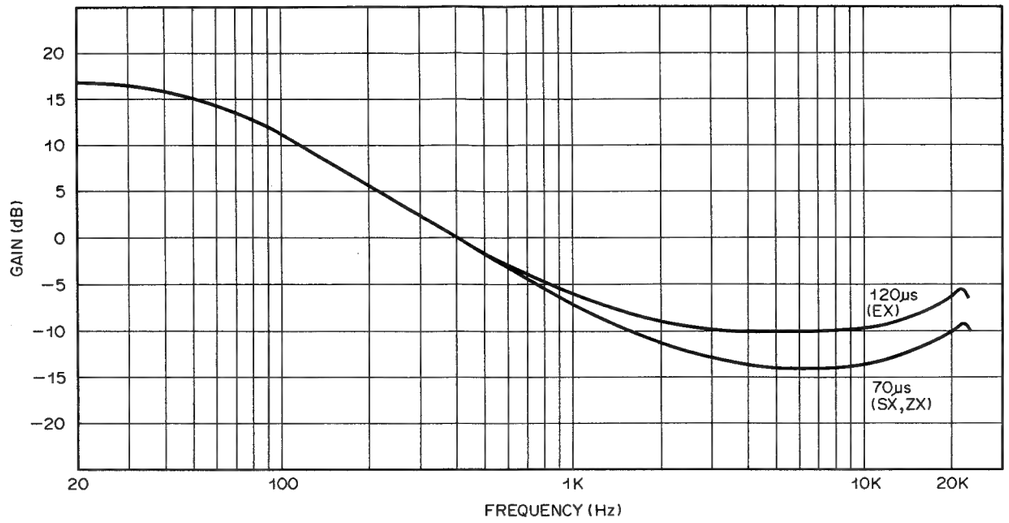


Fig. 10.1

10.2. Record Current Frequency Response

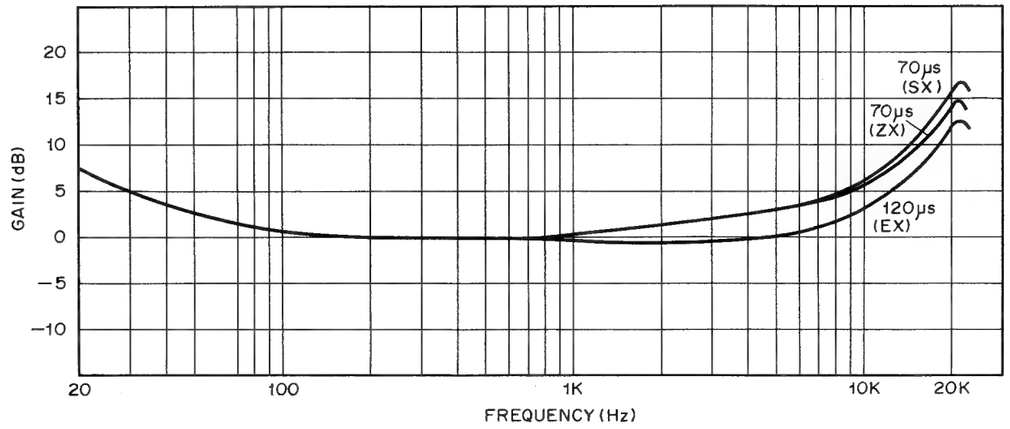


Fig. 10.2

11. BLOCK DIAGRAMS

11.1. Amplifier Section

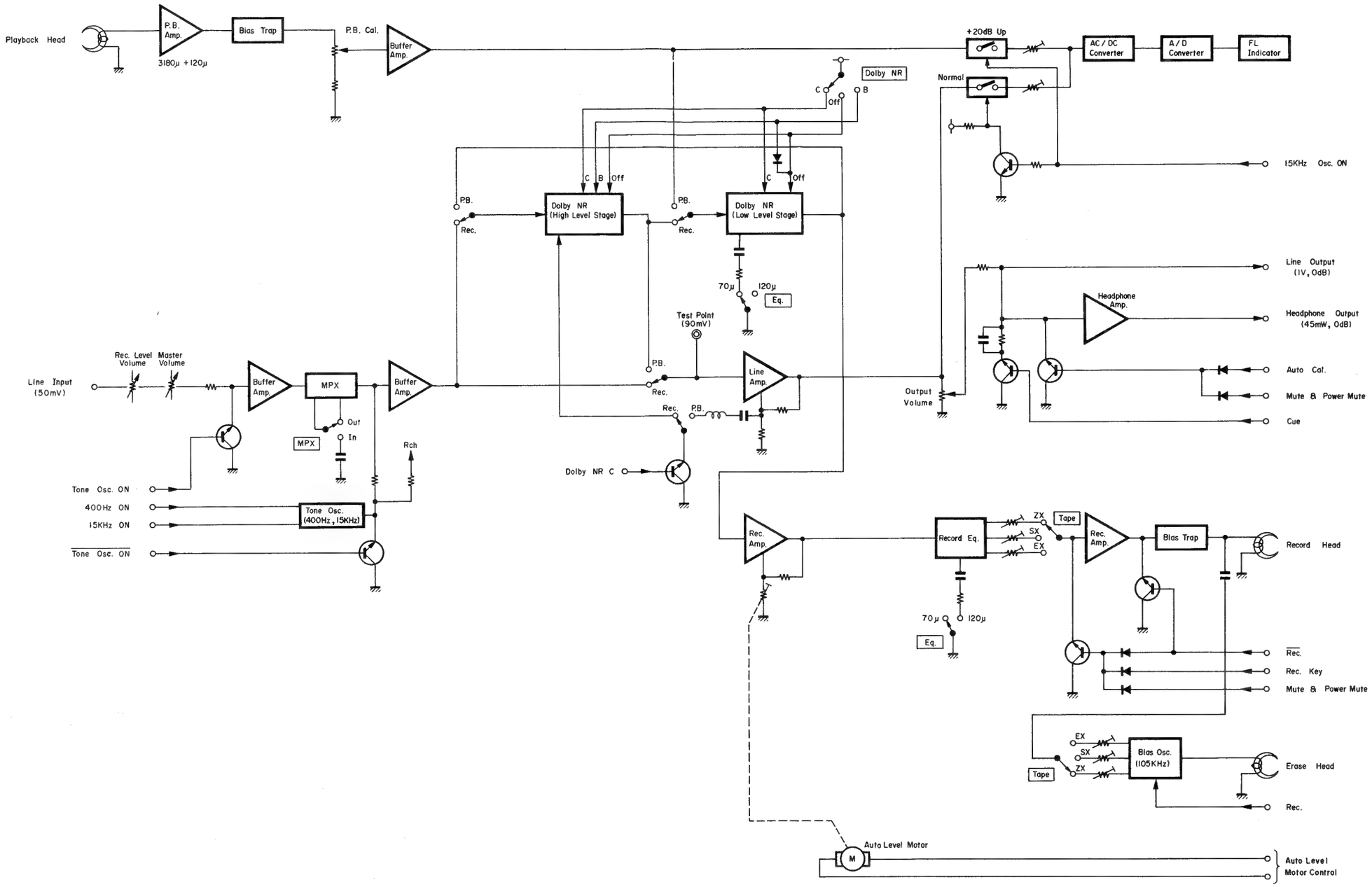


Fig. 11.1

11.2. Mechanism Control Section

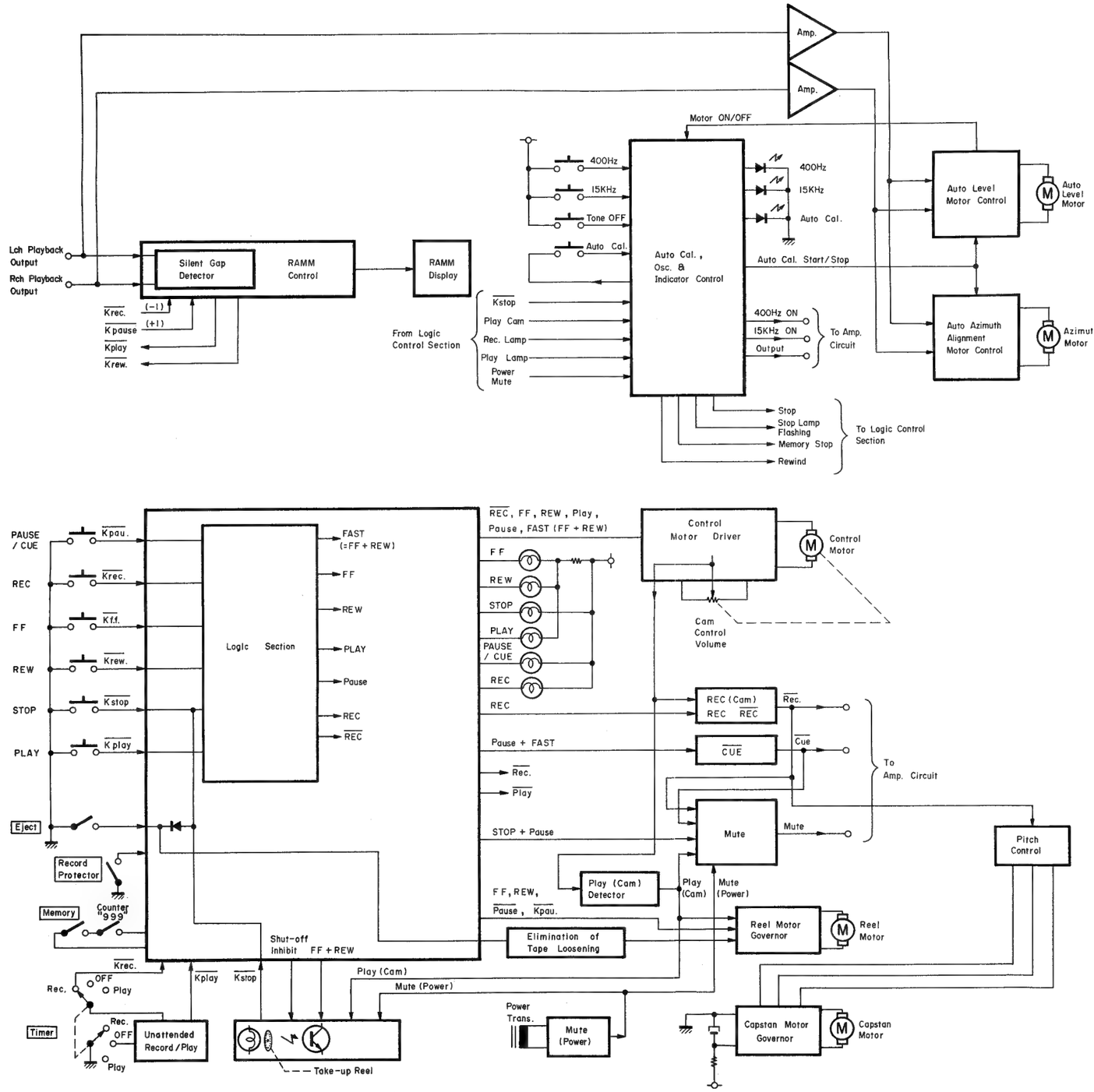


Fig. 11.2

12. WIRING DIAGRAM

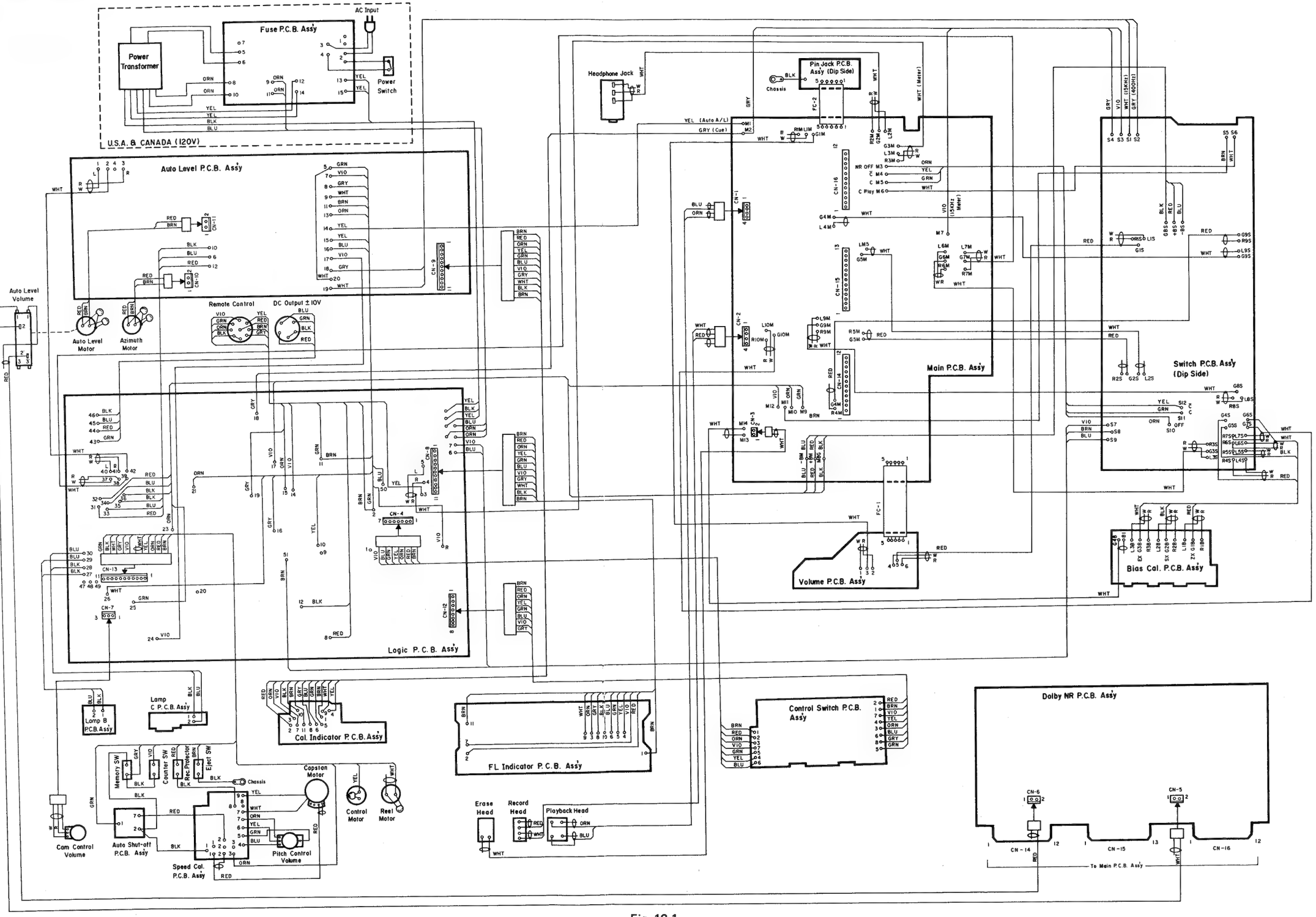


Fig. 12.1

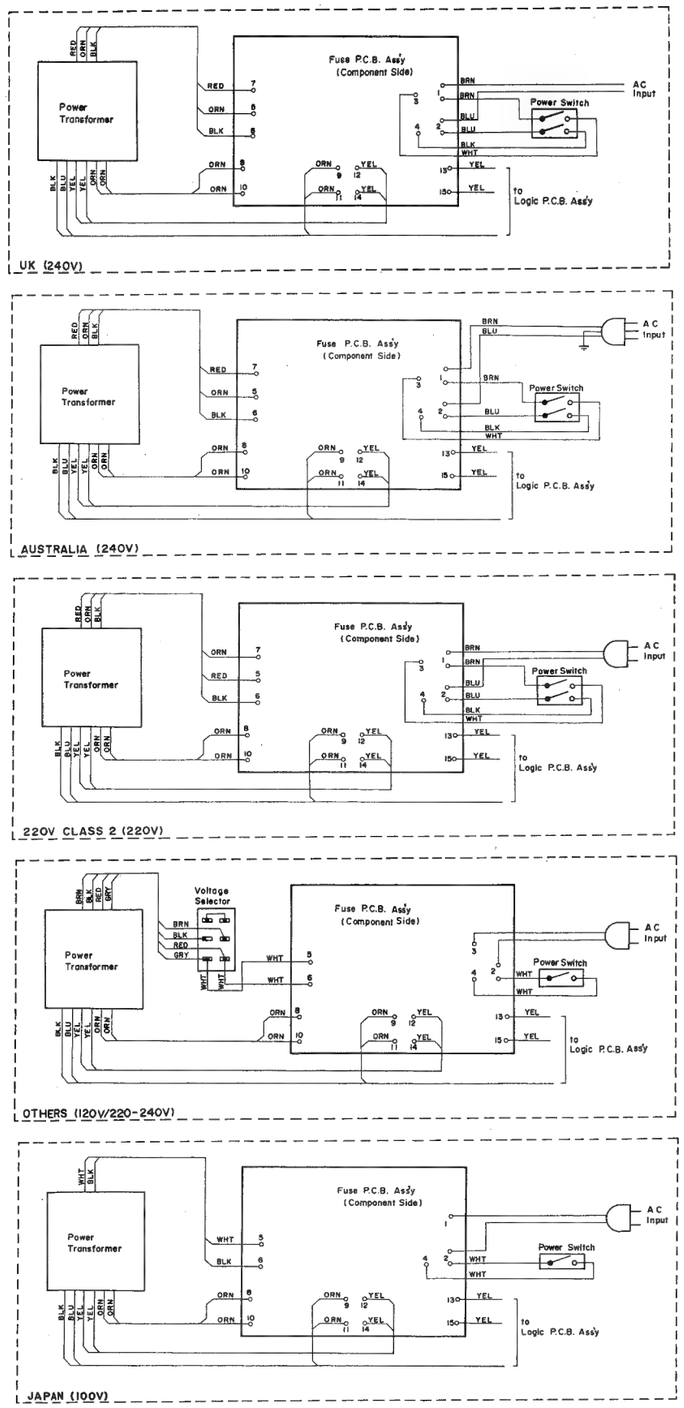


Fig. 12.2

Notes: 1. Table of wire colors

BLK – Black
BLU – Blue
ORN – Orange
GRY – Gray
GRN – Green
RED – Red
BRN – Brown
YEL – Yellow
WHT – White
VIO – Violet

2. Component side view of the P.C.B. is illustrated unless otherwise specified.

13. SCHEMATIC DIAGRAMS

13.1. Attention to Servicemen

(1) Parts Replacement

Following parts shall be replaced with the specified ones. Refer to the parts list.

(a) Power Supply Circuit
Power Cord
Power Transformer T1
Power Switch SW1

(b) Fuse P.C.B. Ass'y
Fuses: F1, 2, 3, 4, 5
Spark Killers

(c) Logic P.C.B. Ass'y
Diode Bridge: D480
Power Transistors: Q424, 425, 426, 427, 432, 434, 441, 450, 453
Fail Safe Type Resistors: R420, 471, 472, 512, 518, 528, 529, 530, 531, 586, 590

(d) Auto Level P.C.B. Ass'y
Power Transistors: Q901, 902, 911, 912

(e) Control Switch P.C.B. Ass'y
Lamps: PL401-406

(f) Lamp P.C.B. B Ass'y
Lamp: PL408

(g) Lamp P.C.B. C Ass'y
Lamp: PL409

(h) Shut-off P.C.B. Ass'y
Fail Safe Type Resistor: R605

(i) Main P.C.B. Ass'y
Power Transistors: Q109, 110, 209, 210
Fail Safe Type Resistors: R149, 249, 301, 302, 305, 306, 312, 313, 315, 316, 319, 320, 328, 329, 336

(j) Switch P.C.B. Ass'y
Fail Safe Type Resistors: R301, 302, 625, 626

(2) Insulation Check

Before returning the repaired N-681ZX to a customer, check to insure that the exposed part is accurately insulated from the AC line by measuring the leakage current or the insulation resistance between them.

13.2. IC Block Diagrams

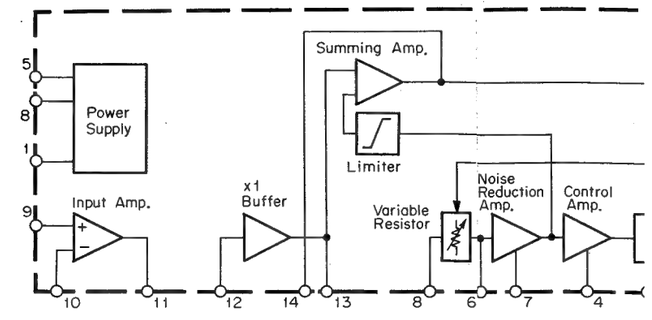


Fig. 13.1 Dolby NR IC μA7300PC

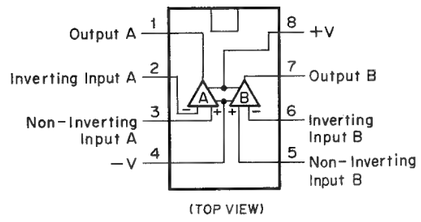


Fig. 13.2 OP Amp. IC 4558, 4559, 4556, 4560

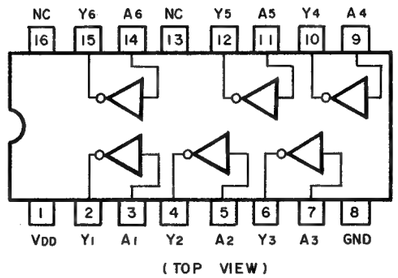


Fig. 13.3 Inverter C-MOS IC μPD4049BC

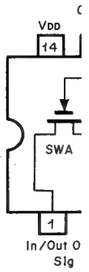


Fig. 13.4 Bil

Fig. 13.5

ock Diagrams

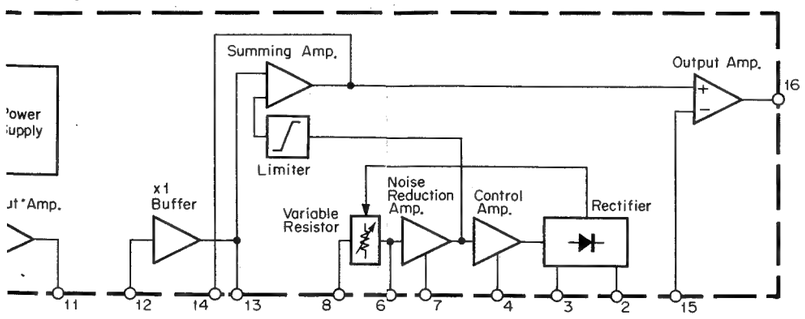
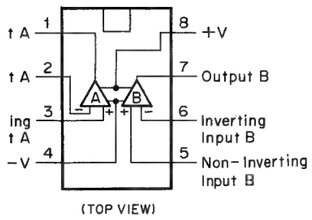


Fig. 13.1 Dolby NR IC μA7300PC



P Amp. IC 4558, 4559, 4556, 4560

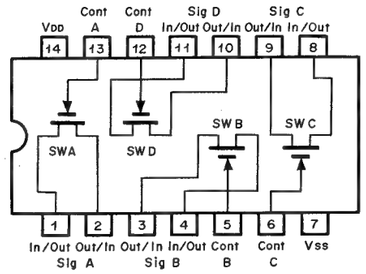
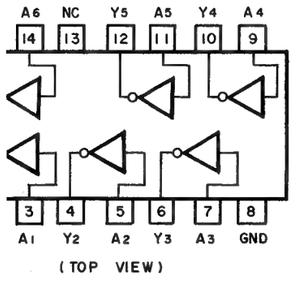


Fig. 13.4 Bilateral Switch C-MOS IC MSM4066RS



Inverter C-MOS IC μPD4049BC

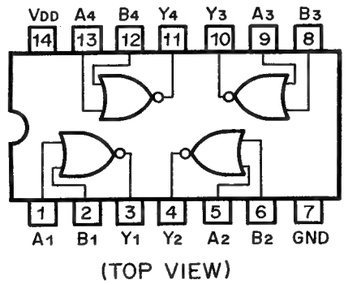


Fig. 13.5 NOR Gate C-MOS IC μPD4001BC

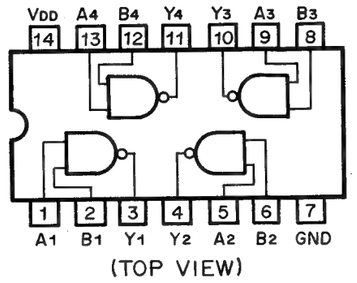


Fig. 13.6 NAND Gate C-MOS IC μPD4011BC

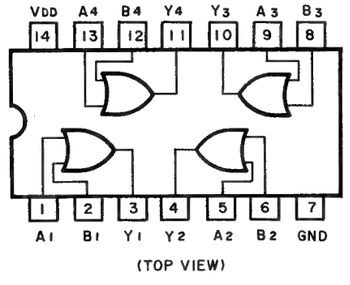


Fig. 13.7 OR Gate C-MOS IC μPD4071BC

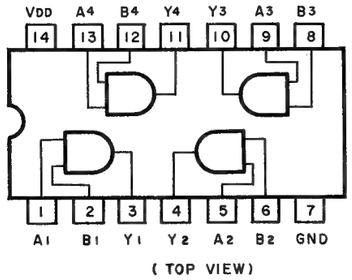


Fig. 13.8 AND Gate C-MOS IC μPD4081BC

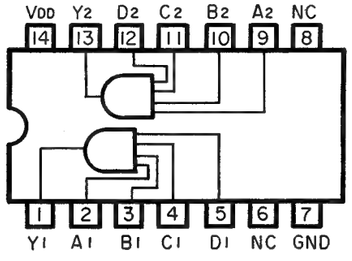


Fig. 13.9 AND Gate C-MOS IC μPD4082BC

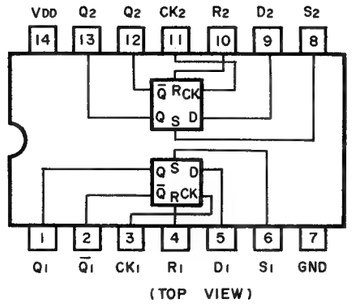


Fig. 13.10 D-Type Flip-Flop C-MOS IC TC4013BP

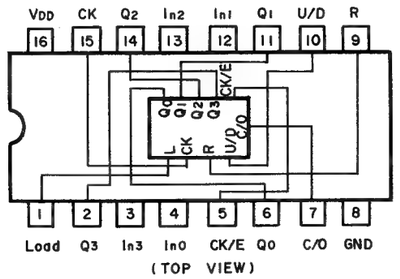


Fig. 13.11 BCD Up/Down Counter C-MOS IC TC4510BP

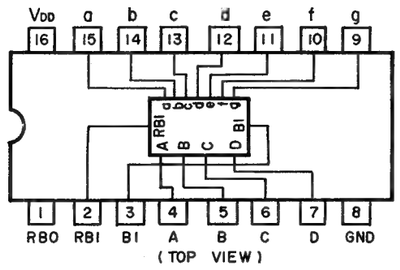


Fig. 13.12 BCD to 7-segment Decoder/Driver C-MOS IC TC5022BP

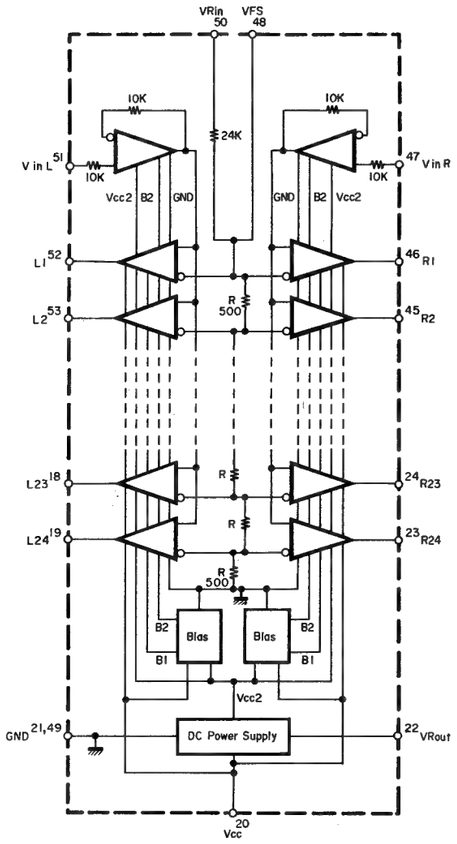


Fig. 13.13 2-Channel 24-Level Comparator for Level Meter MSM803RS

13.3. Amplifier Section

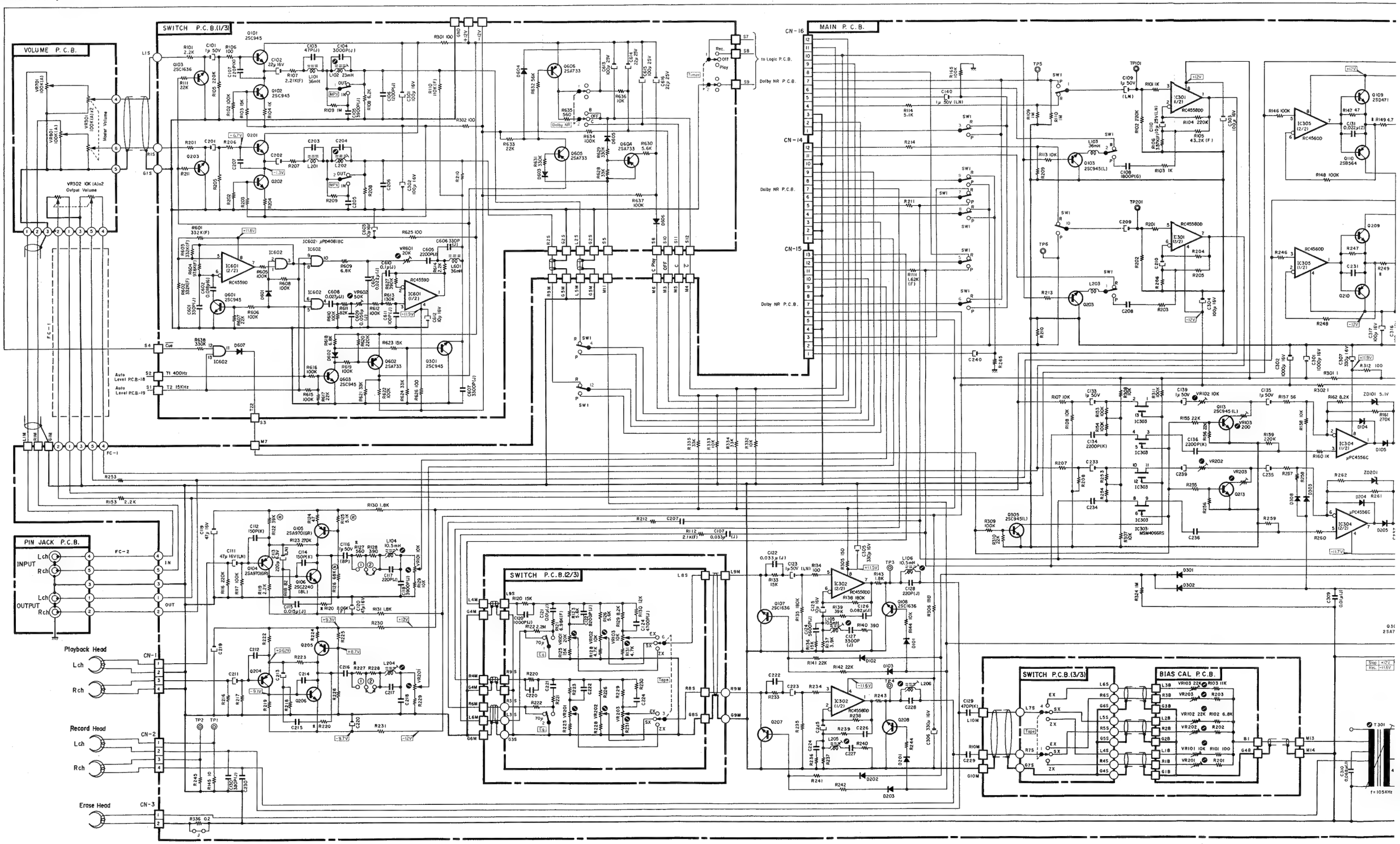
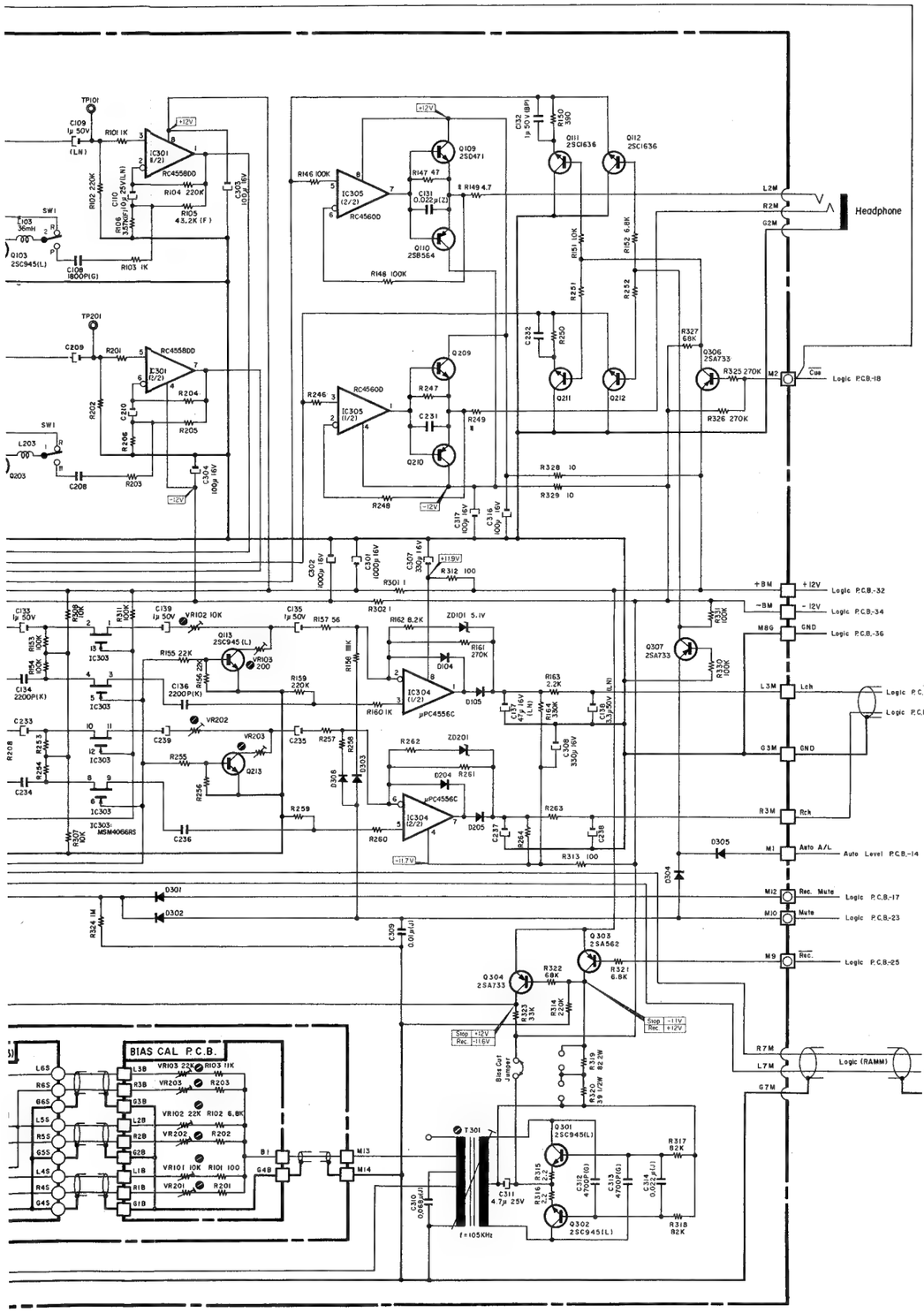


Fig. 13.14

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

Switch Chart	
Description	Schematic Ref. Number
Timer	SW2
MPX	SW3
Dolby NR	SW4
Eq.	SW5
Tape	SW6
Record / Play	SW1



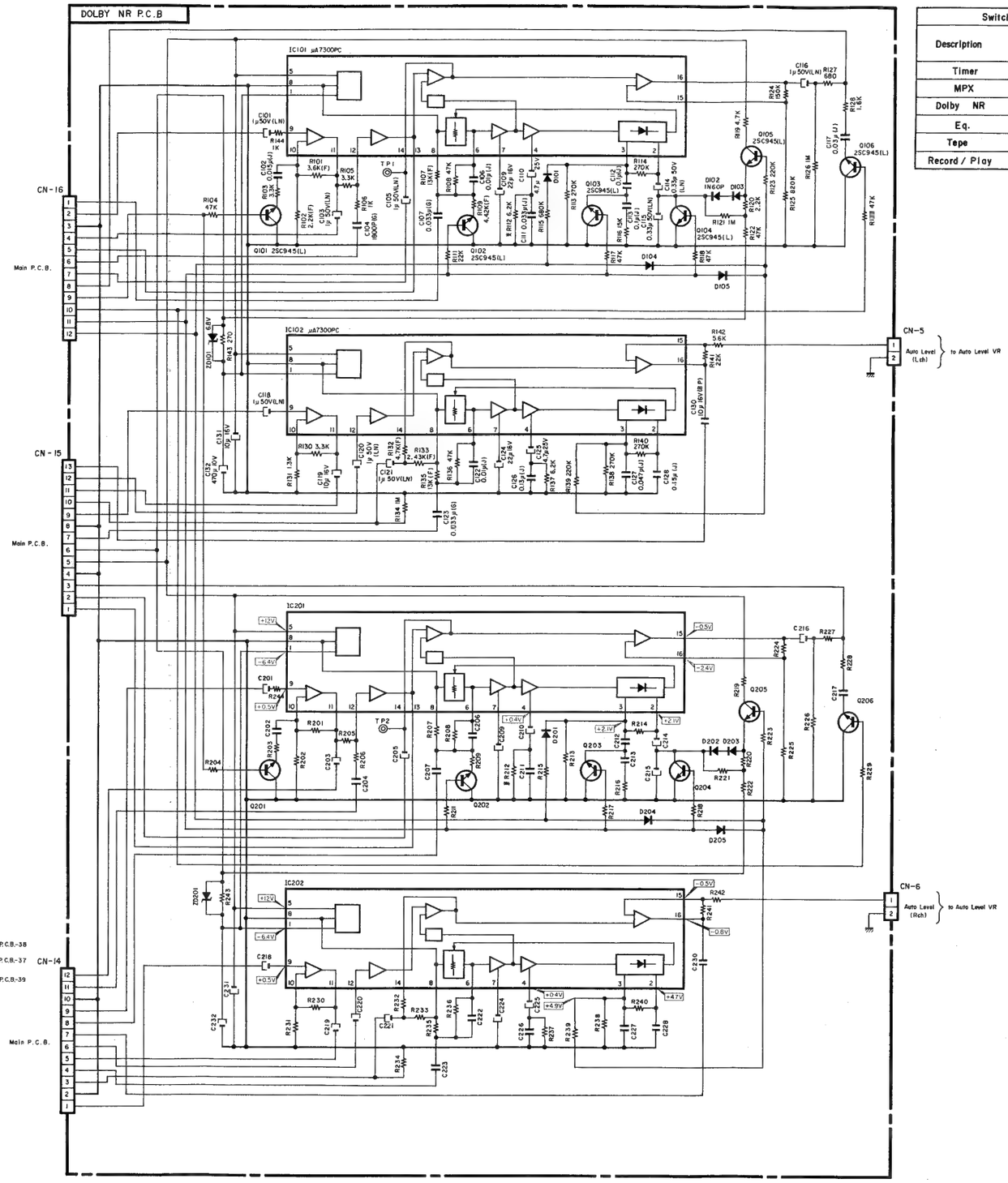
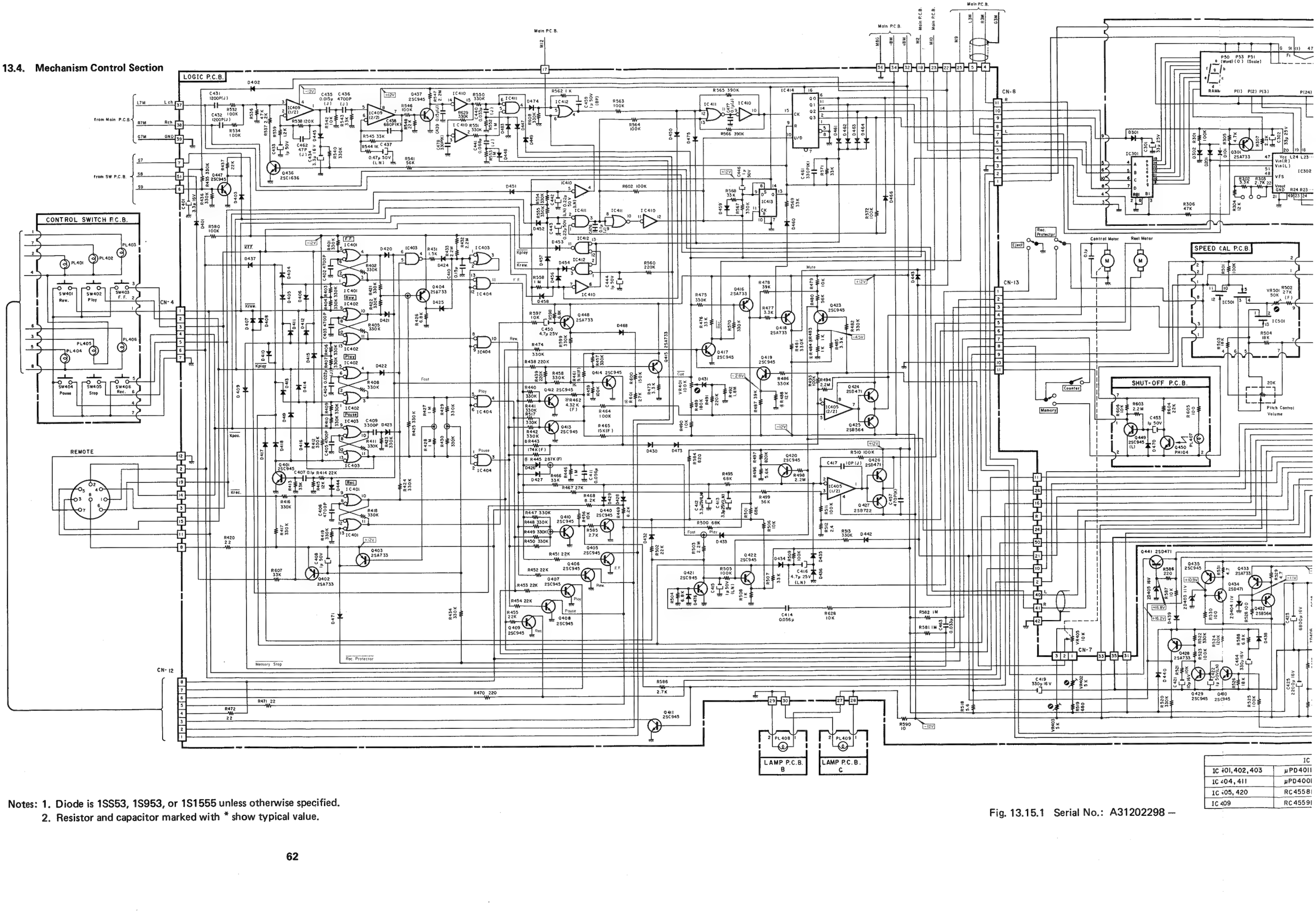


Fig. 13.14

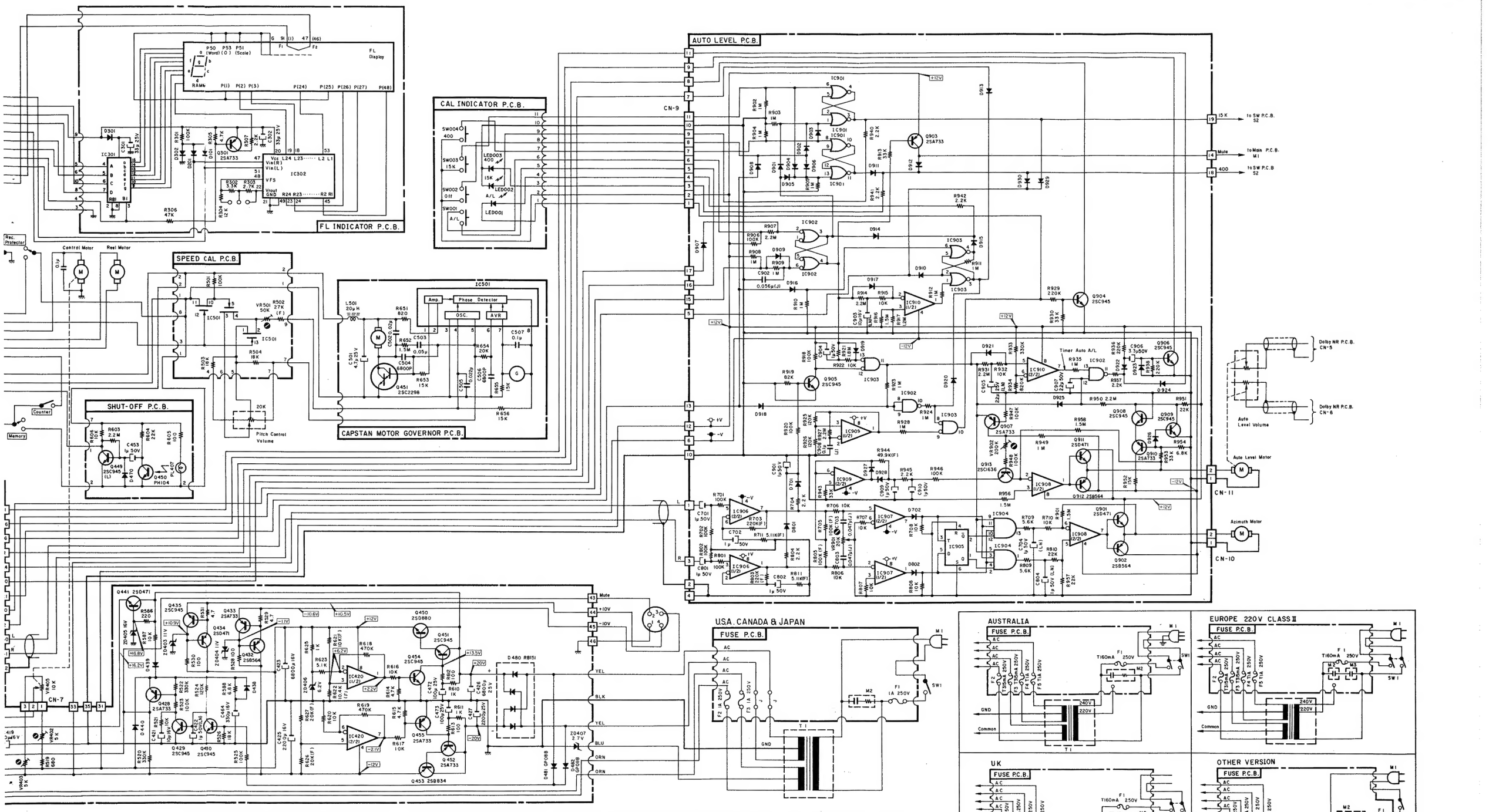
13.4. Mechanism Control Section



	IC
IC 401, 402, 403	μPD4011
IC 404, 411	μPD4001
IC 405, 420	RC4558
IC 409	RC4559

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

Fig. 13.15.1 Serial No.: A31202298 –

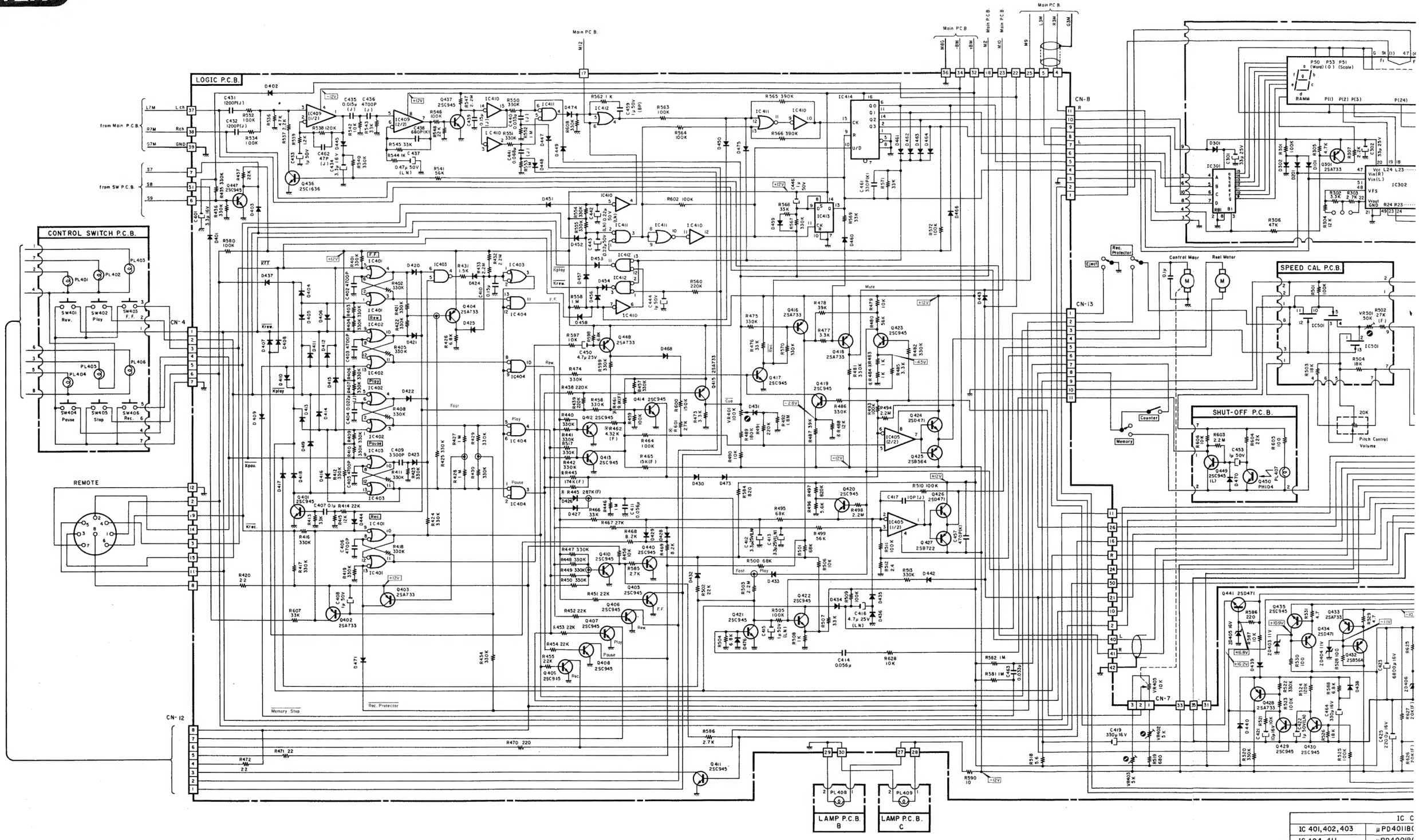


IC Chart (Logic)			
IC 401, 402, 403	μPD4011BC	IC 410	μPD4049BC
IC 404, 411	μPD4001BC	IC 412	μPD4071BC
IC 405, 420	RC4558D	IC 413	TC4013BP
IC 409	RC4559D	IC 414	TC4510BP

IC Chart (FL Indicator, Speed Cal.)	
IC 301	TC5022BP
IC 302	MSM803RS
IC 501	μPD4066BC

IC Chart (Auto Level)			
IC 901, 903	μPD4001BC	IC 906, 908, 909	
IC 902	μPD4011BC	910	RC4558D
IC 904	μPD4082BC	IC 907	μPC4556C
IC 905	TC4013BP		

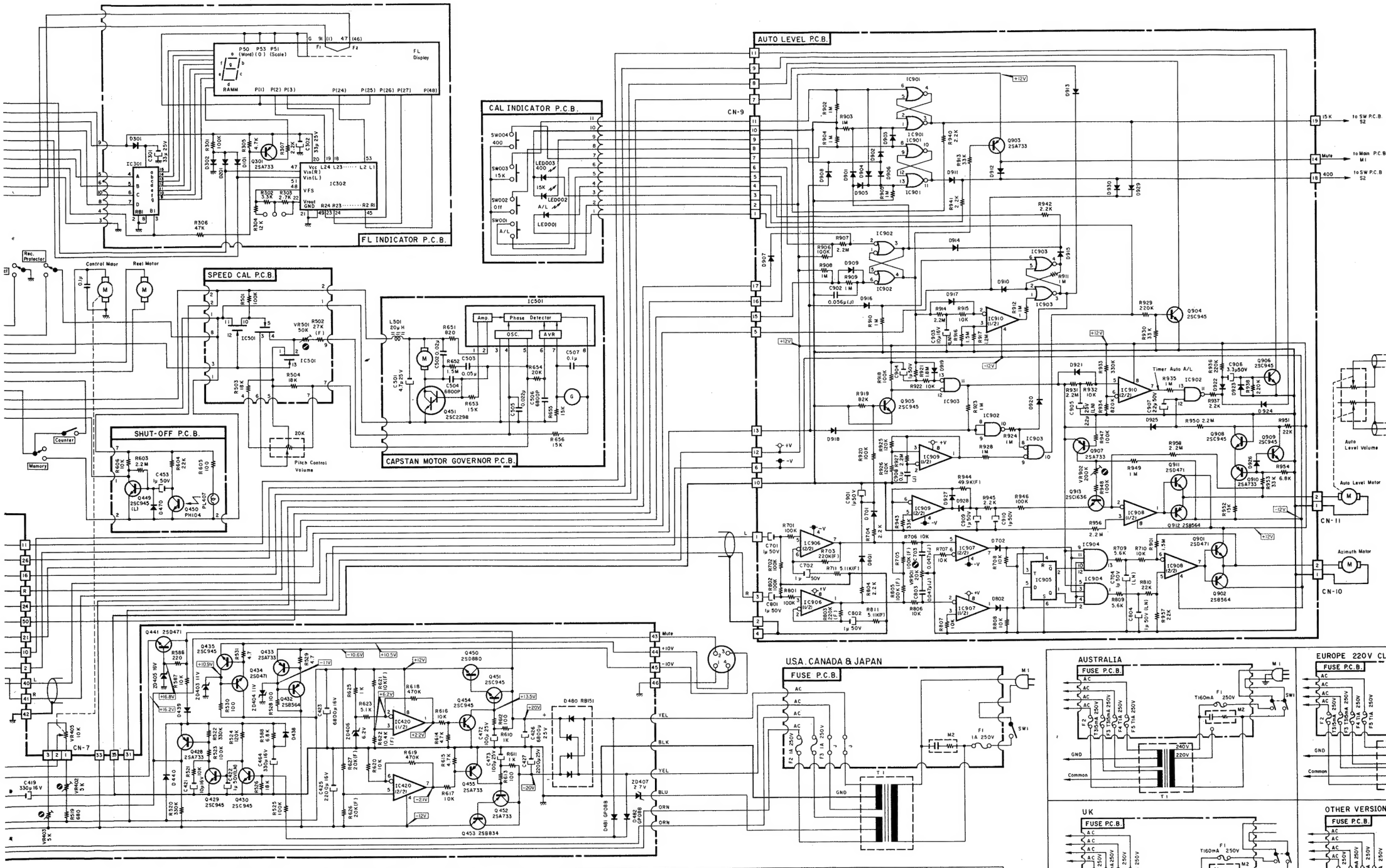
1 Serial No.: A31202298 –



IC C	
IC 401, 402, 403	μPD4011BC
IC 404, 411	μPD4001BC
IC 405, 420	RC4558D
IC 409	RC4559D

Notes: 1. Diode is 1SS53, 1S953, or 1S1555 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

Fig. 13.15.2 Serial Nos.: A31201001 – A31202297



IC Chart (Logic)			
IC 401,402,403	μPD4011BC	IC 410	μPD4049BC
IC 404,411	μPD4001BC	IC 412	μPD4071BC
IC 405,420	RC4558D	IC 413	TC4013BP
IC 409	RC4559D	IC 414	TC4510BP

IC Chart (FL Indicator, Speed Cal.)	
IC 301	TC5022BP
IC 302	MSM803RS
IC 501	μPD4066BC

IC Chart (Auto Level)			
IC 901, 903	μPD4001BC	IC 906, 908, 909	
IC 902	μPD4011BC	910	RC4558D
IC 904	μPD4082BC	IC 907	μPC4556C
IC 905	TC4013BP		

al Nos.: A31201001 – A31202297

14. SPECIFICATIONS

Power Source	100, 120, 120/220-240 or 240 V AC; 50/60 Hz (According to country of sale)
Power Consumption	36 W max.
Tape Speed	1-7/8 ips (4.8 cm/sec)
Wow and Flutter	Less than 0.04% wtd rms Less than 0.08% wtd peak
Frequency Response	20–22,000 Hz ±3 dB (recording level –20 dB, ZX tape) 20–20,000 Hz ±3 dB (recording level –20 dB, SX, EXII tape)
Signal to Noise Ratio	**Dolby C-Type NR on** <70 μs, ZX tape> Better than 72 dB (400 Hz, 3% THD, IHF A-wtd rms) **Dolby B-Type NR on** <70 μs, ZX tape> Better than 66 dB (400 Hz, 3% THD, IHF A-wtd rms)
Total Harmonic Distortion	Less than 0.8% (400 Hz, 0 dB ZX tape) Less than 1.0% (400 Hz, 0 dB, SX, EXII tape)
Erasure	Better than 60 dB (below saturation level, 1 kHz, ZX tape)
Separation	Better than 37 dB (1 kHz, 0 dB)
Crosstalk	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency	105 kHz
Input (Line)	50 mV, 50 k ohms
Output (Line)	1 V (400 Hz, 0 dB, output level control at max.), 2.2 k ohms
(Headphones)	45 mW (400 Hz, 0 dB, output level controls at max.), 8 ohms load
BlackBox Series DC Output	±10 V, 125 mA max.
Dimensions	482 (W) x 143 (H) x 340 (D) millimeters 19 (W) x 5-5/8 (H) x 13-3/8 (D) inches
Approximate Weight	9 kg 19 lb. 13 oz

- Specifications and appearance design are subject to change for further improvement without notice.
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